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Forestry Outlook Study for Africa

Regional report – opportunities and challenges towards 2020

FAO FORESTRY PAPER

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AFRICAN DEVELOPMENT BANK
EUROPEAN COMMISSION
FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
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Foreword

The character of forests is changing as a consequence of the individual and collective - and often conflicting – objectives of the multitude of actors impact the landscape. This is compounded by rapid economic, social, political, institutional, technological and environmental changes in the recent decades. In fact, what happens in the forest sector today is often more influenced by what happens outside than within. As globalisation progresses and economies become more integrated, the opportunities and challenges for the forest sector are unfolding rapidly. Understanding the nature of these changes and developing appropriate responses is thus critical to enable the forest sector to enhance its contribution to society's well-being. It is in this context that FAO initiated a series of global and regional outlook studies to provide the broader and longer term prospects for the forest sector. The Forestry Outlook Study for Africa (FOSA), initiated on the recommendations of the African Forestry and Wildlife Commission and the Near East Forestry Commission, is one of the series of such regional outlook studies.

The main objective of FOSA is to indicate what is likely to happen in the next two decades if the current trends persist and the priorities and strategies that may be pursued to enhance forestry's contribution to sustainable development. In addition to providing a regional overview, FOSA explicitly takes into account subregional specifics and throws light into the potentials and challenges for forestry development in each of the five subregions in Africa. FOSA was a true participatory effort involving all the African countries and leading organizations concerned with forests and forestry in the region. Also, in the process of undertaking the study substantial efforts were made to build up country capacity in outlook studies and strategic planning.

More than providing a set of numbers, FOSA's aim is to catalyse the process of looking forward, enabling the countries to see where they stand in the context of the long term changes and how they could take advantage of their strengths and address the various challenges. Some of the recent initiatives like the National Forest Programme Facility would take advantage of the knowledge base provided by FOSA. In one way, the FOSA process provides a strong base for several other initiatives in the forest sector and to put them in the larger context of the evolving relationship between society and forests. FAO in partnership with the countries and other organizations will continue to strive to build up the national capacity of the countries in strategic planning, enabling the countries to see the long term opportunities and constraints and to adjust and adapt to the changes.

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All the African governments have actively participated and shaped the FOSA process through their nominated national focal points. The country outlook papers prepared by the national focal points formed the foundation of the FOSA process.

The African Forestry and Wildlife Commission and the Near East Forestry Commission have been instrumental in articulating the various issues confronting the forest sector and guiding the study. The success of the process has been largely due to the strong commitment and interest of the members of these Commissions.

From the inception of FOSA in 1998, the African Development Bank has been the key partner of FAO in undertaking the study. The African Development Bank with financial support from the Swedish Trust Funds prepared a baseline study as well as thematic studies in support of FOSA and provided significant technical and financial support for FOSA. The other important partner in implementing FOSA has been the European Commission, whose support to the regional projects on data collection and analysis and sustainable forest management provided a strong information base for FOSA.

The United Nations Economic Commission for Africa provided substantial technical and organizational support in implementing FOSA. Through undertaking specific thematic studies a number of organizations like the Center for International Forestry Research and the World Bank provided immense support to the FOSA process and this is gratefully acknowledged. Interaction with the United Nation's Environment Programme helped to establish synergy between FOSA and the African Environment Outlook Study.

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Abbreviations

CAMPFIRE	Communal Areas Management for Indigenous Resources
CDM	Clean Development Mechanism
CEMAC	Economic and Monetary Community of Central Africa (Communauté économique et monétaire de l'Afrique Centrale)
CEPGL	Community of the Great Lakes Countries (Communauté économique des pays des Grands Lacs)
CGIAR	Consultative Group on International Agricultural Research
CIFOR	Center for International Forestry Research
COMESA	Common Market for Eastern and Southern Africa
EAS	East African Community
ECA	Economic Commission for Africa
ECCAS	Economic Community for Central African States
ECOWAS	Economic Community for West African States
FAO	Food and Agriculture Organization of the United Nations
FDI	Foreign Direct Investment
FOSA	Forestry Outlook Study for Africa
IGAD	Intergovernmental Authority on Development
MAP	Millennium Partnership for African Recovery Programme
NEPAD	New Partnership for Africa's Development
SADC	Southern African Development Community
SEI	Stockholm Environment Institute
UEMOA	West African Monetary and Economic Union (Union économique et monétaire ouest-africaine)
UNCTAD	United Nations Conference on Trade and Development
UNEP	United Nations Environment Programme
UNICEF	United Nations Children's Fund
WAGP	West African Gas Pipeline

Executive summary

Forests and wildlife play a very significant role in the lives of African people. Apart from their economic importance, they also have critical environmental, social, cultural and spiritual values. The society-forest interaction in Africa has been undergoing rapid change, and further change is expected during the next two decades in response to the impact of a number of factors. This report provides a regional overview of the emerging trends, their consequences and the options available.

CURRENT SITUATION

The current situation with regard to forestry in Africa can be summarized as follows:

- the total forest cover in Africa is estimated at 650 million ha, accounting for 21.8 percent of the total land area and 16.8 percent of global forest cover. However, as in the case of other geographical regions, the distribution of forests in Africa is uneven. North and West Africa are the least forested subregions in Africa, largely as a result of their extremely arid conditions, whereas Central Africa is the most forested subregion;
- although Africa has only 16.8 percent of the world's forest cover, it accounted for 56 percent of the forest cover decrease between 1990 and 2000. Three countries – the Sudan, Zambia and the Democratic Republic of the Congo – accounted for almost 44 percent of the reduction in forest cover;
- political, social and economic changes have overshadowed efforts to implement sustainable management, and very little natural forest area is sustainably managed in Africa. Some attempts are under way to introduce reduced-impact logging, but they are in the very early stages;
- Africa has an estimated area of 8 million ha of forest plantations, accounting for about 4.3 percent of the global plantation area. These plantations are concentrated mainly in a few countries. South Africa, Algeria, Nigeria, the Sudan and Morocco together have an area of 4.1 million ha, or 52 percent of the plantation area in Africa. Plantation activity is negligible in countries where there are still large tracts of natural forests (for example Angola, Cameroon, the Central African Republic, the Democratic Republic of the Congo and Gabon);
- as supplies of wood and non-wood forest products from natural forests decline, trees outside forests – grown in homesteads and as woodlots-have become a major source of these products. This is particularly the case with home gardens in the humid-zone countries of Burundi, Rwanda, Uganda and several West African countries;
- forests in protected areas cover approximately 5 percent of Africa's total forest area. The proportion of land under protection varies among subregions and countries. East Africa has the largest proportion of its land under protection (more than 12 percent). An increase in the extent of protected areas is seldom matched by comparable improvements in management. Problems such as encroachment, illegal logging, collection of fuelwood and other products, grazing and particularly poaching persist. Civil strife is a major factor contributing to the decimation of wildlife, especially in Central and East Africa;
- Africa's share in roundwood production increased from 340 million m^3 in 1980 to 699 million m^3 in 2000, accounting for 20.2 percent of global roundwood production. However, the share of industrial wood is very small, since 91 percent of roundwood is used as fuel. Africa's share of the global production of wood products decreases as the degree of processing increases. A few countries, especially South Africa and some in Central and West Africa, produce most of Africa's industrial roundwood;
- much of Africa's formal trade takes place with countries outside the region. Trade in forest products between African countries is negligible;
- the involvement of local communities and entrepreneurs as owners of logging operations in Africa is very limited. A substantial proportion of the timber industry is dominated by outside interests;
- African non-wood forest products include a range of items such as gums and resins, honey and beeswax, medicinal and aromatic plants, dying and tanning materials, bamboo and rattan, bushmeat and fodder. Although they play a major role in the rural economy of Africa, information on their

overall contribution is patchy and incomplete at best, except for a few species and products of commercial importance;
- African forests are often more important for their environmental services. Their role in protecting watersheds and arresting land degradation is particularly significant – and especially critical in the uplands of East and Southern Africa and in arid areas in all the subregions.

DRIVING FORCES

African forestry is influenced by many factors, most of them external to the sector. These factors generally fall into two broad categories: those that affect forests and forestry directly, such as demographic, economic and technological changes, which are traditionally used in modeling production, consumption, etc., and those that are more fundamental but harder to measure, such as political and institutional changes. The main factors that will affect African forestry can be summarized as follows:

- fundamental changes in African systems of government are taking place. Democratic processes are taking hold. The need to decentralize authority and promote participatory approaches to natural resource management is broadly accepted;
- civil society's demand for transparency and good governance is growing and changing the course of development. It will take time before the full impact of these changes can be seen;
- notwithstanding the impact of HIV/AIDS population is projected to grow to 1186 million, an increase of 388 million since 2000. Some countries that are already densely populated and where productivity of the land is low will be particularly affected by population growth, accelerating resource degradation;
- rapid urbanization means that almost 54 percent of the African population will live in urban areas by 2020;
- the HIV/AIDS pandemic will strain the resources of all the key actors;
- the small size of the formal economy, the low per capita income and the correspondingly low rates of savings and investment will hold economic growth down to under 4 percent per year, which means growth in per capita income will be negligible;
- the highly uneven distribution of income and the extent of poverty are unlikely to diminish significantly during the next two decades;
- except for a few countries, Africa is primarily dependent on agriculture and other land-based activities. Continued dependence on land and low levels of productivity will increase pressure on forest land.

CONSEQUENCES

Africa is undergoing fundamental political and institutional changes that could gain momentum during the next two decades with a potential to affect forests and forestry positively. However, in the immediate future a number of negative factors tend to have an overwhelming impact. Population growth will create intense pressure on forests and woodlands. Economic growth will be sluggish in all but a few countries. Poverty will continue to plague Africa, exacerbated by drought and disease, especially HIV/AIDS. Major structural changes in the economies are unlikely, and dependence on land will persist. Improvement in agricultural productivity will be slow, causing forest clearing for agricultural expansion.

The institutional environment is dominated by a public sector whose capacity is continually being eroded, a poorly developed market mechanism controlled by a small private sector with short-term profit maximization as the main objective, and a growing informal sector whose limited access to resources and technology results in overexploitation of resources. The majority of the people are un-empowered and thus unable to play a positive role. The overall impact of such a situation on forests and forestry in the next two decades will be as follows:

- continued loss of forest cover, at roughly the current rates;
- negligible efforts to apply sustainable forest management;
- increasing demand for woodfuel, which in the context of high urban consumption would deplete forest and woodland resources in the vicinity of urban centres;
- Africa's wood products sector is dominated by "low value adding" industries catering largely to external demand. Growth of high value adding industries will be sluggish and Africa is likely to remain an importer of products such as newsprint and printing and writing paper;
- most wood and other products are exported without any value addition, undermining the potential for enhancing employment and income;
- a decline in the state of the environment,

particularly exacerbation of the water crisis because of the deterioration of watersheds, with other negative effects such as declining quantity and quality of water supplies and increased siltation of reservoirs and other irrigation facilities;
- depletion of non-wood forest products, particularly medicinal plants;
- increased conflicts in wildlife management, undermining the potential for expansion of wildlife-based tourism.

On the other hand, fundamental policy and institutional reforms could unleash major changes in economies, with a potential to shift forestry development into the Great Transition scenario. Ongoing efforts such as the New Partnership for Africa's Development, which emphasize the strengthening of democratic processes, conflict resolution, enhanced transparency, improved governance, poverty eradication, the building up of human resources and increased regional and subregional integration, clearly indicate the commitment to a radical change from past trends. Accomplishing the Great Transition will depend on translating the various initiatives into concrete action.

PRIORITIES AND STRATEGIES

Forestry strategies in Africa therefore need to facilitate the Great Transition, addressing the immediate problems but at the same time preparing to meet the challenges of a changed situation. The broad priorities for the forest sector for the next two decades will be:
- poverty alleviation; and
- environmental protection.

Poverty alleviation will require focusing on the production of basic-needs goods and the generation of basic-needs income, while environmental protection will focus on rehabilitating watersheds and degraded land, arresting desertification and protecting biodiversity. The basic approach to accomplish this will be to empower all the key actors, which will involve:
- revitalization of the public sector by redefining its responsibilities and enabling it to play a lead role in creating the conditions necessary for all stakeholders to function effectively;
- support to market forces by fostering the transparent and efficient functioning of the private sector;
- improvement in the efficiency of the informal sector by providing an appropriate institutional and legal framework.

Strengthening the public, private, and informal sectors of the economy will empower all economic actors and help to improve the ability to implement sustainable forest management.

The next two decades will see considerable changes in forestry as Africa undergoes political, institutional and economic transition. As democratic systems become widely established, an upturn in key economic and social variables can be expected after 2010. Until then, forestry and other economic sectors will have to focus on combating poverty by providing essential goods and services and protecting the environment. If political and social changes continue as expected, the economic situation will improve significantly after 2010. This would require reexamination of the priorities outlined here. While environmental protection will continue to be a key priority, a shift towards the production of goods and services appropriate to higher income levels may become necessary.

THE FOSA PROCESS

The Forestry Outlook Study for Africa (FOSA) was undertaken as a highly participatory initiative involving all the countries and key organizations in Africa. Considering the enormous diversity encompassing Africa, the study adopted a subregional approach, dividing Africa into five subregions.

Country involvement

To help provide country inputs, each of the 47 countries nominated a national focal point. These national focal points participated in subregional planning meetings and helped to define the objectives, implementation process and products of FOSA. Drawing upon inputs from a variety of sources, and often supported by a working group of key stakeholders, each national focal point prepared a country outlook paper, which were key inputs to the FOSA process.

Consultation process

A second round of subregional meetings discussed the draft country outlook papers and worked out the approach for developing the subregional reports. FAO appointed forestry experts from the subregions to prepare the draft subregional reports. These drafts were reviewed during a regional technical review meeting hosted by the Economic Commission for Africa in Addis Ababa in September 2001. Revised regional and subregional reports prepared on the basis of comments from the technical review meeting were discussed and endorsed by the African Forestry and Wildlife Commission and the Near East Forestry Commission.

Other partners

While FAO shouldered the responsibility for coordination and implementation of the FOSA, several international, regional and subregional organizations contributed substantially to the study. The European Commission-supported project on data collection and analysis provided necessary background information. The African Development Bank through a Swedish Trust Fund prepared the baseline study, "Population, Income and Forest Resources", which furnished the background information on critical demographic, economic and social parameters. Using the trust fund facility, the African Development Bank also prepared two thematic papers for each subregion – one on driving forces and the other on key issues in forestry. Linkages were created with the United Nations Environment Programme (UNEP) to establish synergy with the ongoing Global and Africa Environment Outlook studies. The World Bank commissioned a study on institutional issues, addressing decentralization, community participation, privatization, and corruption and illegal activities. The Center for International Forestry Research (CIFOR) contributed a paper on science and technology issues that focuses on research priorities and the capacity for undertaking research.

In undertaking the FOSA, FAO took advantage of the enormous information at its disposal, including the Forest Resource Assessment 2000 and the forest products statistics. FAO also undertook studies projecting the production and consumption of wood and wood products and the consumption of woodfuel in Africa to the year 2030. Further, a questionnaire survey was undertaken to elicit civil society's perception on the forestry situation in Africa.

Technical support

An Advisory Group consisting of African forestry experts provided technical guidance for FOSA. FAO also established an Internal Advisory Committee to oversee progress of FOSA implementation and to provide technical support.

Chapter 1

Introduction

AFRICA IN TRANSITION

Africa is undergoing rapid political, economic and social transition. Initiatives are under way to bring about an African renaissance, which will take advantage of the continent's unique social, cultural and spiritual values to realise the vast potential of its human and natural resources. The New Partnership for Africa's Development (NEPAD) is one recent effort to articulate a comprehensive approach to addressing Africa's problems and to provide a new vision for the continent.

Forests are expected to play a critical role in supporting this transition. It is in this context that the African Forestry and Wildlife Commission and the Near East Forestry Commission initiated the Forestry Outlook Study for Africa (FOSA), to be coordinated by the Food and Agriculture Organization of the United Nations (FAO) as a collaborative effort involving all African countries, the African Development Bank, the European Commission and various regional and subregional organizations.

FOSA OBJECTIVES

The primary objective of FOSA is to provide a long-term perspective for the development of the forest sector in African countries within the context of wider economic, social, institutional and technological changes, using 2020 as the reference year. FOSA analyses the trends and emerging economic, social and political forces that will shape the sector during the next two decades. Based on this analysis, it will indicate the options to improve forestry's contribution to sustainable development. FOSA is designed to complement African countries' other forest-related strategic planning initiatives, in particular their national forest programmes.

FOSA has been implemented as a consultative process involving all the key stakeholders, in particular the countries. Wide-ranging discussions were held to develop a shared vision of what could be done to realize the full potential of forestry in Africa.

The main products of FOSA are five subregional outlook reports and a regional overview report. This regional report, which draws on the five subregional

BOX 1

AFRICAN FORESTRY: SOME QUESTIONS

- Is the current rate of deforestation in response to the growing demand for land and products likely to persist?
- Can African forests meet growing demands for products and services sustainably?
- What role can forests play in alleviating poverty?
- Are we likely to see a different kind of forestry, which is environmentally viable, economically efficient and socially and culturally acceptable?
- Can increased awareness of the importance of forests be translated into effective action and perceptible change?
- How is African forestry adapting to the forces of globalization, avoiding the pitfalls and making full use of emerging opportunities?
- How can Africa most effectively capitalize on its unique wildlife resources?

BOX 2

FOSA SUBREGIONS

North Africa:
Algeria, Egypt, Libyan Arab Jamahiriya, Mauritania, Morocco, Sudan, Tunisia

East Africa:
Comoros, Djibouti, Eritrea, Ethiopia, Kenya, Madagascar, Mauritius, Seychelles, Somalia, United Republic of Tanzania, Uganda

Southern Africa:
Angola, Botswana, Lesotho, Malawi, Mozambique, Namibia, South Africa, Swaziland, Zambia, Zimbabwe

Central Africa:
Burundi, Cameroon, Central African Republic, Chad, Congo, Democratic Republic of Congo, Equatorial Guinea, Gabon, Rwanda, Sao Tome and Principe

West Africa:
Benin, Burkina Faso, Cape Verde, Côte d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, Togo

outlook reports, outlines the continent-wide situation and outlook, and provides an indication of where African forestry stands in the global context.

STRUCTURE OF THE REPORT

Chapter 2 describes the key features of the forest sector in general, focusing particularly on the state of resources and their management, and on the provision of goods and services. Chapter 3 outlines the political, institutional, economic, technological and environmental factors influencing the forest sector and their implications for the future. Considering the potential impact of external factors, chapter 4 discusses the various scenarios that currently exist and how they could evolve during the next two decades. The implications of currently prevailing scenarios for forestry, especially with regard to the state of resources and the provision of goods and services during the next two decades, are discussed in chapter 5. Chapter 6 focuses on priorities and strategies that are important in the context of moving to the more desirable scenario of the Great Transition. Key findings and follow-up measures are indicated in the final chapter.

Chapter 2

Forestry and wildlife in Africa: current trends

Forests and wildlife play a very significant role in the lives of African people. Apart from their economic importance, they also have critical social, cultural and spiritual values. The society-forest interaction in Africa has undergone rapid changes, and what we see today is an outcome of this. An overview of the current situation and broad trends is provided below as a starting point for assessing long-term scenarios for development in the sector.

THE STATE OF FOREST RESOURCES AND THEIR MANAGEMENT

Africa is characterized by extremely varied ecological conditions, ranging from humid forests to deserts and from montane temperate regions to coastal mangrove swamps. Superimposed on this ecological diversity are varying degrees of human interaction, as reflected in the existence of a variety of farming systems (FAO and World Bank, 2001). In the densely populated humid zones of West and Central Africa, a substantial area of forest has been converted to cash-crop and subsistence cultivation. Vast tracts in Central Africa have low population densities and extensive forests. Animal husbandry is an important land use in arid and semi-arid regions, and nomadism is a key adaptation to seasonal variations in the availability of fodder and water. There are also vast areas of savannah woodland that have been converted for rainfed agriculture. This mosaic of land use has a direct bearing on forests and forestry, especially deforestation and the nature of forest use.

Forest cover and changes therein

The total forest cover in Africa is estimated at 650 million ha, accounting for 21.8 percent of the land area and 16.8 percent of global forest cover (FAO, 2001a). However, as in the case of other geographical regions, the distribution of forests in Africa is uneven. North and West Africa are the least forested subregions, largely as a result of their extremely arid conditions, whereas Central Africa has nearly 44 percent of its land under forests, accounting for 37 percent of Africa's forests.

Considerable differences in the extent of forest cover and the type of vegetation exist within each subregion. For example, Chad, with a forest cover of about 10 percent, is in the arid Sahelian belt, while most of the rest of Central Africa is in the high-rainfall humid zone, with tropical rain forest being the dominant vegetation. Except for the humid coastal zone, West Africa is mostly dry, dominated by the vast stretch of the Sahel extending from the Niger to Senegal. Mali and the Niger which are almost entirely in the Sahelian zone, together account for almost 50 percent of the land area of the West Africa subregion. The influence of population pressure on forest area is more obvious in countries such as Burundi and Rwanda which have relatively little forest cover[1] and high population densities. Most of the forests in Central Africa are in the low-population-density countries of the Congo basin.

High rates of deforestation in Africa have resulted in a loss of about 53 million ha of forest cover between 1990 and 2000 (FAO, 2001a). Although Africa has only 16.8 percent of the world's forest cover, it accounted for 56 percent of the forest cover decrease between 1990 and 2000. Three countries – the Sudan, Zambia, and the Democratic Republic of the Congo – accounted for almost 44 percent of the reduction in forest cover in Africa.

Another key feature of the forestry situation is the extreme variability in growing conditions and consequent differences in productivity across the

TABLE 1
Forest cover in the various subregions

subregion	Land area (million ha)	Forest area (million ha)	Percentage (%)
North Africa	941.4	68.2	7.2
East Africa	411.1	85.6	20.8
Southern Africa	591.1	183.1	31.0
Central Africa	551.5	240.7	43.6
West Africa	505.3	72.2	14.3
Total Africa	**2 978.4**	**649.9**	**21.8**

Source: FAO, 2001a.

[1] 3.7 and 12.4 percent in Burundi and Rwanda respectively, which have population densities of 255/km^2 and 293/km^2.

TABLE 2
Forest cover change in Africa

subregion	1990 (million ha)	2000 (million ha)	Annual change (%)
North Africa	77.5	68.1	-0.94
East Africa	90.8	85.6	-0.51
Southern Africa	199.4	183.1	-1.62
Central Africa	250.1	240.7	-0.93
West Africa	84.7	72.2	-1.26
Total Africa	**702.5**	**649.9**	**-0.80**

Source: FAO, 2001a.

continent. In the Sahelian zone the woody biomass of forests is as low as 4 tonnes per hectare, whereas in the tropical rain forests of Central Africa it is more than 200 tonnes per hectare. A major part of Africa is arid, which means that biomass productivity is extremely low. In these areas, extraction often far exceeds natural productivity, but substantial investment is needed to increase productivity. On the other hand, the Congo basin and the humid zone in West Africa are inherently more productive, with considerable scope for commercially viable investment, although the high land productivity also increases competition from other uses.

Management of natural forests and woodlands

Efforts to introduce systematic management of natural forests in Africa have a long history. Most have focused on regulating harvesting and on managing forests for "sustained yield" in the classical sense. However, political, social and economic changes have overshadowed these efforts. As a result, very little natural forest area is sustainably managed in Africa. Some attempts are under way to introduce reduced-impact logging, but they are still in the very early stages.

Consequently, it is hard to make any realistic assessment of the technical, economic and environmental aspects of natural forest management and the probability of change during the next two decades. Future management of the humid forests of Central and West Africa will be largely influenced by:

- the objectives and perceptions of the logging industry;
- the global demand for tropical hardwoods, including shifts in the direction of trade towards the emerging markets;
- the ability of governments to regulate the activities of the forest industry and especially to enforce compliance with the principles of sustainable forest management.

There are several ongoing efforts to improve technical and institutional capacities for management. A number of organizations, including national and international non-governmental organizations, are pursuing efforts to strengthen the capacity to implement sustainable forest management. However, their impact has so far been patchy. The policy and legal changes brought about have often not been sustained. Even in countries where forests generate substantial surpluses, investment in forestry has been very low.

With economic diversification, however, there is considerable potential for implementing sustainable forest management in a number of forest-rich countries. Countries such as Gabon, Equatorial Guinea, Angola and the Democratic Republic of the Congo have alternative – and probably more valuable – resources such as oil and minerals, which means that they have less need to rely on forests as a source of revenue. Much of the problem, however, concerns the ability to capture the income from these resources and use it effectively for sustainable development.

In contrast, resource use conflicts are severe in savannah woodlands as a result of the combination of low natural productivity and intense demands. The dependence of people on a variety of products and the existence of various systems of resource use add to the complexity of the problem. Management plans are available for a negligible fraction of the area. While these forests are important for local communities, their low commercial value makes them less attractive for investment, and the ability of local communities to invest in them is limited. They are thus largely characterized by low investment and high resource exploitation by many users. The prospects for improving the situation will depend on:

- the capacity of local communities to manage the resources sustainably, which will require the strengthening of institutional and technical capabilities;
- government policies and support for building local communities' capacity to manage resources.

Although there have been considerable efforts to develop participatory approaches to woodland management, the scale of such efforts is far from adequate. In spite of the policy and legal changes made in a number of countries, large-scale community-based woodland management is still a long way off. This suggests that savannah woodland will continue to decline during the next two decades.

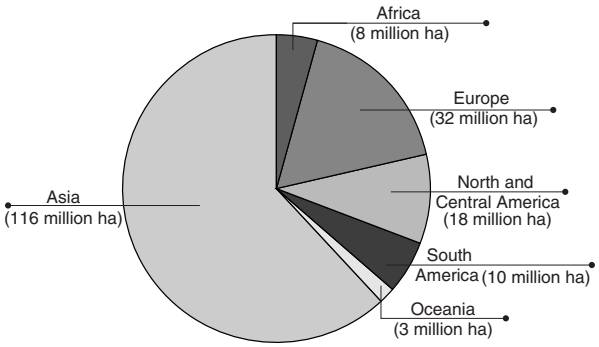
Forest plantations

Africa has an estimated area of about 8 million ha of forest plantations, accounting for about 4.3 percent of the world's plantation area (FAO, 2001a). These plantations are primarily concentrated in a few countries – South Africa, Algeria, Nigeria, the Sudan and Morocco, which together have an area of 4.1 million ha, or 52 percent of Africa's plantation area. As in other tropical regions, the early phase of plantation development focused on high-value hardwood species such as teak (*Tectona grandis*). Since the 1960s, the emphasis has shifted to fast-growing species, especially eucalypts and pines primarily grown for supplying industrial wood, particularly for the pulp and paper industry, and to meet woodfuel demand.

Annual planting in Africa is estimated at 194 000 ha, or about 4.4 percent of the global planing (see FAO, 2001a). Most of the planting is taking place in a small number of countries such as the Sudan, Algeria, Nigeria, Tunisia, South Africa, Senegal and Morocco – primarily countries with low forest cover. Conversely, plantation activity is negligible in countries where there are still large tracts of natural forests (for example Angola, Cameroon, the Central African Republic, the Democratic Republic of the Congo and Gabon). This partially reflects the historical pattern of forest industry development, which has relied on logging natural forests. The low domestic demand and consequent low prices (largely on account of the easy availability of wood from natural forests and woodlands) is a major disincentive for investment in plantations.

The long-term comparative advantage of African forest plantations will depend on resolving a number of technical, economic and institutional issues. Most important of these is the vertical linkage between wood production and processing. In this regard, only South Africa has a highly developed and globally competitive wood products industry. Good infrastructure, high-quality research and development capacity, highly skilled human resources, a favourable policy and institutional environment, integration with processing and a strong linkage with global markets make South African plantations competitive. Plantations have also been established in other countries with the aim of facilitating the development of forest-based industries[2]. However, the absence of industrial development has undermined the economic viability of plantations, resulting in their poor management and outright neglect. Privatization of these plantations is an option under consideration in a number of countries, although this is not a sufficient condition to improve their competitiveness, especially in view of the rapidly changing global wood supply situation[3].

FIGURE 1
DISTRIBUTION OF FOREST PLANTATIONS BY REGION



The long-term potential of plantations largely depends on the species planted and their end uses. In recent years much of the plantation expansion in Africa, as in other developing regions, has focused on short-rotation species, largely to supply wood to the pulp and paper industry. This market is becoming saturated and the unit value of pulpwood has not increased significantly during the past ten years. Since oversupply at the global level is likely, Africa may not have any comparative advantage in investing in pulpwood production, at least until the domestic demand increases.

Teak is another species that has been planted extensively in Africa, especially in Côte d'Ivoire, Nigeria, Togo and Ghana. There is some potential for further expansion of teak and such other hardwood species. Emerging niche markets for high quality wood suggest the long term potential of such plantations, although this may be affected by technological changes in wood processing significantly altering the comparative advantages[4].

[2] In most countries these plantations were established with donor support during the period when forest-based industrial development was the most widely accepted paradigm.

[3] A number of authors have recently pointed out the possibility of an imminent glut of plantation-grown timber as plantations raised during the past two decades mature and are harvested. This is expected to take place particularly in Pacific Rim countries, and could drastically reduce the price and make a large area of plantations economically unviable (Leslie, 2001).

[4] Of particular interest is the emergence of materials technology enabling the incorporation of any property, physical or structural, into any kind of wood. This means that some of the species traditionally valued for their appearance and strength may lose their market advantages when substitutes with the same properties become available.

Future expansion of plantations in countries such as South Africa, where processing capacity is well developed, faces a number of constraints. Most important of these is the impact on water supplies. In view of growing water stress (United Nations Environment Programme, 2000), fast-growing plantations may not be an appropriate option in several countries. The 1998 National Water Act of South Africa treats afforestation for commercial purposes as a streamflow reduction activity and levies a charge, thus reducing the incentive for establishing and managing plantations. Land tenure, and more particularly land restitution and reform, is another politically and socially critical issue affecting plantation development in a number of Southern African countries.

Therefore, further expansion of forest plantations can take place only in countries where there are unlikely to be any water constraints. Such prospects may, however, be limited because:

- potential areas with no water constraints are far away from markets and ports, increasing the cost of transport and reducing the competitiveness of wood production;
- areas where water stress is unlikely to become critical are also areas with considerable potential for agriculture, so that forest plantations will have to compete with more profitable agriculture in these areas.

Furthermore, the development of viable plantation units will require substantial investment on a long-term basis. This will depend on conditions such as political stability and land tenure. Under the present circumstances it is unlikely that Africa will be able to become a major player in the forest plantation sector, except in the case of South Africa where a strong plantation industry has already come into existence. Although Africa has some advantages in terms of land availability, other factors – such as inadequate infrastructure, poor links with processing, political instability, environmental problems and uncertain land tenure – act as constraints on the development of a viable industry. A few countries, such as Mozambique, United Republic of Tanzania and Zambia, may have some potential for expanding their plantation programmes.

Trees outside forests

As supplies of wood and non-wood forest products from natural forests decline, trees outside forests have become a major source of these products. Trees form an integral part of a variety of agro-ecosystems, each with specific economic, social and environmental features, and each with its own potentials and constraints. In broad terms, trees outside forests are found on homesteads, under mixed cropping systems, in woodlots and on communal land.

Trees grown on farms are a major source of wood and other products. This is particularly the case with home gardens in such humid-zone countries as Burundi, Rwanda, Uganda and several of the West African countries. Most household needs for woodfuel and timber are met from trees grown in home gardens. Many cash-crop systems also support trees, originally grown as shade for the main crop, but eventually becoming a major source of wood, as in the case of *Grewillea robusta*, grown on tea plantations in Kenya. In the Sudan, *Acacia senegal*, the source of gum arabic, is largely grown by farmers as part of agroforestry systems, although some large farms have also started cultivating this species on a commercial scale in recent years.

As the demand for wood increases and supply from forests declines, growing trees on private land has become more popular, especially where land tenure is secure. For example, farm woodlots have expanded considerably in Kenya and have become the most important source of wood. There is also room for expansion of tree growing in the humid zone of West

BOX 3

KENYA: THE FUTURE OF THE FOREST SECTOR LIES OUTSIDE GAZETTED FORESTS

Under the proposed forest policy, the future of the forest sector lies outside gazetted forests. This is vital, given that gazetted forests represent less than 2.5 percent of the total land area of Kenya. The country has about 37.6 million ha of natural woody vegetation outside forests, consisting of 24.8 million ha of bushland, 10.8 million ha of wooded grassland and 2.1 million ha of woodland. A further 9.54 million ha of woody vegetation is found on farmland and in settlements.

The results of farmers' efforts can be seen from the Forestry Master Plan Survey of woody biomass, which indicated that about 40 percent of the woody biomass is from planted trees and that the total volume of trees planted by farmers equals that of closed-canopy indigenous forests and government forest plantations combined. On the basis of the results of this study, it is estimated that farmland and settlements contain on average about 9.3 m^3 of woody biomass per hectare and that this is increasing at an annual rate of 0.5m^3 per hectare.

(Kenya Forestry Department, 2001)

Africa, especially as cash crops become less profitable, and in the irrigated agricultural land of North Africa, particularly in the Sudan and Egypt. Industry-supported outgrower schemes have encouraged tree growing in Southern Africa, especially South Africa and Zimbabwe. In the Sudan the legislation making it mandatory that all irrigation schemes set aside 5 percent of the area as forests and plantations has encouraged substantial tree planting.

Wildlife management

The extent of protected areas in Africa is about 207 million ha, or approximately 6.6 percent of the land area. These areas include forests as well as other ecosystem types. Approximately 5 percent of Africa's total forests are now protected. The proportion of land under protection varies among subregions and countries. East Africa has the largest proportion of its land under protection (more than 10 percent).

An increase in the extent of protected areas is most often not matched by comparable improvements in management. Problems such as encroachment, logging, the collection of woodfuel and other products, grazing and particularly poaching persist. Civil strife is also a major factor contributing to the decimation of wildlife, especially in Central and East Africa. Although some countries, especially in East and Southern Africa, have promoted wildlife-based tourism, there are several problems to be addressed. A study by the World Conservation Monitoring Centre shows that Africa's investment in park management is the lowest in the world[5] (James, 1999). The number of staff assigned to manage protected areas is also low, an average of eight people per 1000 km^2 in West and Central Africa, 36 people per 1000 km^2 in Southern and East Africa, and 60 people per 1000 km^2 in North Africa and the Near East. With such low levels of investment, it is not surprising that some protected areas exist only on paper.

Institutional arrangements for managing protected areas range from parastatal organizations, such as the South Africa National Parks Board and the Kenya Wildlife Service, to government departments, as in Botswana, Malawi, Uganda and Zambia. Both systems have their advantages and disadvantages. In the case of direct government management, shrinking resources and lack of flexibility have undermined their effectiveness. On the other hand, parastatal bodies are under growing pressure to increase their income. In the process, there is a tendency to neglect less profitable activities such as habitat improvement, with most attention being paid to commercially attractive components such as tourism.

A key problem of protected area management is the increasing conflict between people and wildlife. In many cases national parks and game reserves have been established on land appropriated from local communities. These communities usually do not benefit from the protected areas, and often face added costs in terms of loss of life, damage to property and competition with wildlife for limited resources such as water and fodder. Consequently, local people often feel considerable antagonism toward protected areas. Efforts to involve local communities in wildlife management, including benefit sharing, as in the case of the Communal Areas Management Programme for Indigenous Resources (CAMPFIRE) in Zimbabwe, have yet to be widely adopted. East Africa, especially Kenya and Tanzania, have made similar efforts to integrate wildlife and livestock management. Their experience gives an idea of both the potentials and constraints (see Boyd *et al.*,1999). Involving local communities and ensuring equitable benefit distribution are essential to sustainable protected area management (see Box 4).

In assessing the future implications of protected area

BOX 4

RESOLVING CONFLICTS IN WILDLIFE MANAGEMENT

Most wildlife managers now admit that 'conservation in a vacuum' has no future and recognize the need to replace the approach with a strategy that seeks to involve local people and integrate their needs into the management of wildlife resources. Protected area management approaches that pursue externally enforced exclusion of local people are crumbling under the pressures of illegal hunting and encroachment by crop farms. The current trend is towards evolving ways in which wildlife management schemes can provide concrete benefits in terms of food and income to local people who live with the wildlife and have to bear the cost of doing so. In areas where wild animal population densities are high and can sustain a measure of exploitation, questions are beginning to be asked about the feasibility of incorporating subsistence hunting by local hunters into the management equation.

(Ntiamoa-Baidu, 1997)

[5] According to the study, West and Central African annual budgets for protected areas were only US$ 23 per km^2 in 1996. The corresponding figure for North Africa and the Near East was US$ 74, and for East and Southern Africa US$ 257 (James,1999).

management in Africa, it is important to consider the following issues:

- Africa's wildlife is a unique resource, especially in view of the potential for tourism, which is one of the fastest growing industries; even given the current state of management, wildlife-based tourism is a major source of income for a number of countries;
- increasing land use conflicts, lack of infrastructure, perceptions of insecurity and vulnerability to external factors are key constraints on realizing its full potential;
- development of appropriate institutional arrangements for managing protected areas will be crucial to enhancing efficiency and equity; community participation will be essential to the sustainable management of protected areas;
- although commercialization of protected areas is being pursued, it is important that adequate regulatory measures be put in place to maintain the unique features of protected areas and ensure that benefits are fully captured by local people.

SUPPLY OF GOODS AND SERVICES FROM FORESTS

African forests produce a wide range of goods and services catering to the diverse needs of people locally, nationally, regionally and globally. One of the key problems in assessing the contribution of African forests is the absence of reliable information, even in the case of marketed goods. The dominance of the informal sector means that official statistics on production, consumption and trade tend to be unreliable. This is particularly the case with locally collected and used woodfuel and construction materials such as sawlogs and poles.

Industrial wood and wood products

Africa's share in roundwood production increased from 340 million m^3 in 1980 to 699 million m^3 in 2000, accounting for 20.2 percent of global roundwood production (FAO, 2002a). A distinctive feature of wood production in Africa is the low value addition, since 91 percent of all roundwood is used as fuel. Africa's share of global production progressively decreases, the greater the degree of processing (see Box 5). While in 2000 it accounted for about 30 percent of global woodfuel production, its share in sawnwood, wood-based panels, fibreboard, and paper and paperboard was 1.8 percent, 1.1 percent, 0.7 percent and 0.9 percent respectively[6].

[6] Based on production estimates for 2000 (FAO, 2002a).

BOX 5

AFRICAN FOREST PRODUCTS CONSUMPTION COMPARED TO OTHER REGIONS

Consumption of forest products in Africa in 2000 (per capita)

Product	Africa	Asia	S. America	N. America	Europe	World
Roundwood (m^3)	0.876	0.281	0.972	1.589	0.783	0.554
Fuelwood (m^3)	0.796	0.210	0.535	0.325	0.154	0.291
Industrial roundwood (m^3)	0.080	0.072	0.436	1.264	0.629	0.262
Sawnwood (m^3)	0.013	0.019	0.074	0.386	0.165	0.070
Wood-based panels (m^3)	0.003	0.014	0.026	0.132	0.088	0.032
Printing and writing paper (kg)	1.8	8.0	10.0	68.0	42.0	16.0

Source: FAO, 2002a.

The table above compares the pattern of forest product consumption in Africa to global consumption patterns. Average per capita roundwood consumption in Africa was substantially greater than the global average and about three times of the Asian average in 2000 and higher than the European average. The main difference concerns the nature of wood products consumed. In Africa, almost 91 percent of the wood is consumed as fuel, whereas globally woodfuel accounts for about 53 percent of wood consumption. Even in other developing regions like Asia and Latin America the share of wood consumed as fuel is less than in Africa. African consumption of processed wood products is much lower than other regions and this proportion declines sharply with higher degrees of value addition. The key questions relating to enhancing consumption of forest products in Africa relate not to an increase in the per capita consumption of roundwood, but to:

- Reducing the proportion used as woodfuel and increasing the proportion that is processed; and
- Ensuring long term sustainability of consumption.

Some of the key features of African production and consumption of forest products are as follows (see Box 6):

- the most important use of wood in Africa is as a source of energy, except for a small number of countries in North Africa and Southern Africa;
- with a population of about 21 percent of the African total and a gross domestic product (GDP) of 40 percent of the African total in 2000, North Africa's share of industrial roundwood production was under 7 percent, making the subregion highly dependent on imports;
- a few countries, especially South Africa and some

BOX 6

AFRICAN WOOD PRODUCTION AND CONSUMPTION: KEY STATISTICS

• Annual roundwood production	699 million m^3
• African share of global production	20.2 percent
• African share of global fuelwood production	29.9 percent
• African share of global industrial roundwood production	4.4 percent
• Annual per capita roundwood production	0.876 m^3
• Annual per capita woodfuel consumption	0.796 m^3
• Proportion of wood produced in Africa consumed as fuel	91.0 percent
• Forest product exports in 2000	US$2 937 million
• Forest product imports in 2000	US$2 531 million

(FAO, 2002a)

in Central and West Africa, produce most of Africa's industrial roundwood;

- in South Africa, industrial roundwood production is almost entirely based on plantations, unlike the situation in Central Africa, West Africa and some countries in Southern Africa, where it is primarily logged from natural forests;
- a number of countries have imposed restrictions on log exports to encourage domestic processing;
- much of Africa's formal trade takes place with countries outside the region, while the volume of intra-African trade is very low[7];
- the involvement of local communities and entrepreneurs as owners of logging operations in Africa is very limited, and a substantial proportion of the timber industry is dominated by outside interests.

Woodfuel

Woodfuel, including charcoal, accounted for about 91 percent of Africa's roundwood production in 2000 (FAO, 2002a). The share of woodfuel in worldwide roundwood production has declined over time, but in Africa the proportion of woodfuel has remained unchanged, and in some countries even increased. Woodfuel, including charcoal, is the most important forest product of a number of countries, but since most production and consumption of woodfuel takes place in the informal sector, quantity estimates are difficult and unreliable.

Although demand and supply are balanced in the aggregate, there are areas of acute deficit, resulting in extraction far above sustainable supply levels. This is particularly the case close to urban centres. In several countries wood energy programmes have tried to address this problem. Typically, they have focused on increasing supplies by improving forest and woodland management and establishing woodfuel plantations, including urban and peri-urban plantations. Demand-reducing measures include increasing efficiency through the use of improved cooking devices and alternative fuels. Several countries in Africa, including Angola, Nigeria and the Sudan, could bring about energy substitution and supply commercial fuel to neighbouring countries. Private sector involvement in the distribution of liquid petroleum gas (LPG) and the strong commitment of the government to encouraging energy switching are resulting in a significant decrease in woodfuel consumption in the Sudan. ECOWAS is actively spearheading the West African Gas Pipeline, which could help to use the large volume of natural gas that is currently flared by Nigeria.

While the potential for energy switching exists, its success will depend on political commitment and the resolution of conflicts of interest. Consequently, the pace of such developments and the extent to which they will help to overcome the problem of rural and urban energy demand, especially by households and traditional industries dependent on wood, are uncertain.

Non-wood forest products

Although non-wood forest products play a major role in the rural economy of Africa, information on their overall contribution is patchy and incomplete at best, except for a few species and products of commercial importance. African non-wood forest products include a range of products, such as gums and resins, honey and beeswax, medicinal and aromatic plants, dyeing and tanning materials, bamboo and rattan, bushmeat and fodder. The relative importance of non-wood forest products in Africa varies considerably. In general, they can be classified as those used for subsistence consumption and those that have been commercialized.

Non-wood forest products are important to the livelihoods of rural communities, especially in the context of low economic growth rates and fluctuating

[7] Very little information is available on the illegal trade in forest products, but it could be substantial.

crop production. For example, in certain areas of Ghana and Cameroon, non-wood forest products account for more than half of the household income[8]. Bushmeat forms the major source of protein for a substantial number of people, especially in West and Central Africa (see also Box 7 on bushmeat use in East and Southern Africa). A study in Zambia notes increasing substitution of wild vegetables for purchased food in response to the declining purchasing power of households brought on by HIV/AIDS (Barang *et al.,* 2001).

In addition to the large number of non-wood forest products that meet subsistence needs, several of them have been commercialized and generate substantial income for countries. Gum arabic, rattan, cashew nuts, wattle, shea butter and cork are some items that have a long history of trade. The Sudan accounts for about 80 percent of the world's gum arabic production, and until recently this was one of the country's most important sources of foreign exchange[9]. Although Central and West Africa have substantial rattan resources, local processing is yet to develop significantly. Much of the raw rattan is thus exported, especially to Southeast Asia (Sunderland, 2001).

With increased opportunities for trade, the non-wood forest product sector is undergoing perceptible changes. Of particular significance are emerging markets for "ethnic foods", medicinal plants and "biological goods". African nationals living outside Africa are importing a substantial quantity of ethnic foods, and interest in these is broadening. Increased trade in medicinal plants from Southern Africa is reported, especially to China. With improved access to information on markets and technology, the prospects for continued growth of some of the non-wood forest products are bright, although this may result in over exploitation and depletion.

BOX 7

BUSHMEAT USE IN EAST AND SOUTHERN AFRICA

Illegal bushmeat utilization and trade is believed to be developing and increasing at a considerable rate (in East and Southern Africa). The use of bushmeat is an important social and economic activity that occurs in many habitats and ethnically diverse areas. Its role in maintaining communities' livelihoods, food security and nutritional status through subsistence consumption is critical to many, and the emerging importance of trade markets has resulted in bushmeat being viewed as a considerable economic resource that contributes substantially to household and national economies. Bushmeat is increasingly being regarded as a valued resource due to the direct benefits it currently provides to communities. Decreasing standards of living and increasing human populations are resulting in an overall increased demand for the resource.

(TRAFFIC, 2000)

Among the non-wood forest products, medicinal plants deserve particular attention. With the limited access to modern medicine, traditional medicines are the mainstay of the health system in most African countries. The importance of medicinal plants is not confined to rural areas. Several studies indicate that people in cities continue to depend heavily on traditional medicines (see Box 8).

BOX 8

URBANIZATION AND USE OF TRADITIONAL MEDICINES

In African countries with large urban populations, medicinal plant use has changed from being a purely specialist activity of traditional medical practitioners to one involving an informal sector group of medicinal plant gatherers. Unlike the rural traditional medical practitioners, who gather medicinal plant material in small quantities, the prime motivation of the commercial gatherers is an economic one. This results in disregard for traditional conservation practices where they exist and an opportunistic scramble for the last bag of bark, bulbs or roots. High rates of unemployment and low levels of formal education (and a low chance of access to the formal job market) have given rise to a flood of popular medicinal plant material to supply the urban demand, keeping prices low and volumes sold high. In the case of medicinal plants harvested and exported for the pharmaceutical industry, prices are also kept low through agreements on prices that do not take resource replacement costs into account.

(Cunningham, 1997)

[8] A household survey conducted in the South Province of Cameroon indicates that non-wood forest products account for almost 44 percent of household income. Among these products, bushmeat occupies an important position, accounting for about 31 percent of household income and often much more than is obtained from the cultivation of cash crops such as cocoa (see van Dijk, 1999).

[9] The gum arabic market is poised for far-reaching changes owing to the growing role of the private sector in cultivation and trade. The Malaysian African Agriculture Company has already established more than 33 000 ha of gum arabic plantations in Blue Nile and Kordofan states and aims to become a major global producer of gum arabic. This will probably adversely affect a large number of traditional producers. Competition could drive prices down, with serious consequences for the income of rural producers. This may even have an environmental impact, in that traditional producers may find it more economical to fell trees and convert them into charcoal than to manage them for the production of gum arabic.

However, several problems affect the commercial and subsistence use of non-wood forest products. The lack of systematic efforts to conserve and manage resources is a major concern. In only a few cases have efforts been made to cultivate non-wood forest products. However, cultivation often excludes those who have traditionally depended on the products. Moreover, commercial production is often subject to the boom-and-bust cycles so typical of many non-wood forest products. Another key issue is that despite Africa's comparative advantage as a major source of raw material and its wealth of traditional knowledge, its share in processing and value addition remains negligible. Some efforts to add value to non-timber forest products within Africa have been made, especially in the case of gum arabic and shea butter, but on the whole they have been inadequate.

BOX 9

GROWING WATER SCARCITY

Most countries in the Near East and North Africa can be classified as having absolute water scarcity today. By 2025, these countries will be joined by Pakistan, South Africa and large parts of India and China. This means that they will not have sufficient water resources to maintain their current level of per capita food production from irrigated agriculture – even at high levels of irrigation efficiency – and also to meet reasonable water needs for domestic, industrial and environmental purposes.

(www.cgiar.org/iwmi/home/wsmap)

Environmental values

African forests are often more important for the environmental services they provide than for the wood and non-wood forest products they produce. Their role in watershed protection and in arresting land degradation is particularly significant – and especially critical in the uplands of East and Southern Africa and in arid areas in all the subregions. Watershed degradation is affecting agriculture in most of the major river basins. Currently 14 countries in Africa are subject to water stress or water scarcity, and the number is expected to increase by another 11 by 2025 (United Nations Environment Programme, 2000; see also Box 9). Many urban areas are already facing acute water and power scarcity, largely because of the decrease in the storage capacity of reservoirs caused by heavy siltation.

Intensification of agriculture in Africa, which is critical to overcoming food insecurity, requires measures to protect watersheds and arrest land degradation. Since water is a key resource, the role of forests and trees in altering evapotranspiration and infiltration and thus affecting downstream water availability must be fully understood. This is particularly important for countries in the Sahel, as well as the dry zones of Southern and East Africa.

Controlling desertification and land degradation is a major issue in most African countries. Windbreaks and shelterbelts have been used to stabilize shifting sand dunes and reduce the effects of dry winds on agricultural crops. Food security, especially in the Horn of Africa, will depend in part on how trees are integrated into the farming system and whether people have access to forest and tree resources during periods of drought and famine. In many traditional communities, the role of trees and forests in protecting the environment is well understood. Religious and cultural beliefs ensure the protection of trees and woodland for their environmental and social values.

African forests are rich in biodiversity, although information on its long-term potential is scanty or at best fragmented. Almost all African countries (except Liberia, Libyan Arab Jamahiriya and Somalia) are signatories to the Convention on Biological Diversity, although the capacity of most countries to protect and manage biodiversity remains very limited. The key problems concerning biodiversity conservation include:

- the inability to integrate the concept of biodiversity conservation into all economic activities, especially land use;
- the focusing of most biodiversity conservation efforts on protected areas, to a large extent ignoring the vast areas outside the protected areas; in the context of declining resources, even protected areas are not effectively managed;
- lack of understanding of the long-term economic potential of biodiversity and the inability to invest in improving know-how; while there is substantial indigenous knowledge, there has been very little effort to nurture this and increase its utility in a more systematic manner;
- despite some efforts at bioprospecting, the inability of most countries and local communities to take advantage of this, along with their often limited bargaining power.

Cultural values

The cultural and spiritual dimensions of forests and trees in Africa are well recognized, and individuals and communities often assign a higher value to these

aspects than the direct economic benefits. Most communities have beliefs and customs relating to specific forests and trees, which thus help in their protection. The practice of maintaining sacred groves is widespread in most African countries, with local customs forbidding the cutting of trees in sacred groves and burial grounds. In a way the cultural and spiritual dimension has helped local communities to adopt a balanced approach to resource use and prevented overexploitation.

However, as society develops and interacts with other cultures and values, the traditional values and beliefs undergo changes. There has been very little effort to see their contextual relevance and to learn lessons that are of wider relevance. As narrow utilitarian values gain primacy, some of the cultural and spiritual aspects tend to decline in importance, together with the opportunity to learn about the multifaceted links between people and nature in traditional societies and their relevance or otherwise in the context of change.

CONCLUSION

This chapter has outlined the current situation with regard to forest resources in Africa and the goods and services derived from them. While Africa still has about 22 percent of its land area under forests, this is shrinking rapidly. Moreover, the distribution of forests among the various subregions and countries is uneven, creating significant imbalances in the demand and supply of forest goods and services. While South Africa has been able to develop a strong forest industry based on forest plantations, in most other countries natural forests and woodlands form the main source of industrial wood supplies. Woodfuel accounts for most of the roundwood production, and investment in value addition remains limited.

The forest sector is in a dynamic state, undergoing rapid changes, which are altering the forest cover and consequently the flow of goods and services. The future state of forests and the goods and services they provide will depend on the impact of these factors and how society as a whole adapts to the changes. The following chapter focuses on change drivers and their impact on the forest sector.

Chapter 3

Factors affecting the forest sector

What happens to forests and forestry is largely determined by what happens outside the realm of forests. African forestry is no exception and is influenced by many factors, most of them external to the sector. It is necessary to understand how they influence the multitude of actors whose actions directly and indirectly affect forests and wildlife.

These factors generally fall into two broad categories: those that affect forests and forestry directly, such as demographic, economic and technological changes, which are traditionally used in modeling production, consumption, etc., and those that are more fundamental but harder to measure, such as political and institutional changes, and, most important, overall changes in society, including its values, attitudes and perceptions.

POLITICAL AND INSTITUTIONAL CHANGES

Political and institutional changes fundamentally affect patterns of resource use. During the past two decades, Africa has witnessed significant political changes, especially a shift from authoritarian regimes to democratic governments. Although the transition is slow and chequered, people are increasingly aware that they can decide how they will be governed. Issues such as human rights and transparency are key concerns. An active civil society is emerging in Africa, increasingly influencing a wide range of issues, including natural resource management.

An important outcome of the process of democratization is the increasing role assigned to individuals, communities and the private sector. Political and institutional reforms are creating economic incentives for change. The changes that are of direct and indirect relevance to forestry include:

- decentralization and devolution of administration and community participation in resource management;
- private sector involvement in commercial activities and the transfer of public sector commercial ventures to the private sector;
- civil society involvement;
- efforts to resolve conflicts and wars.

Decentralization and community participation

One area of profound change concerns the devolution of administrative responsibilities to subnational entities and the increased emphasis on community participation.

BOX 10

MAIN FACTORS AFFECTING AFRICAN FORESTRY: AN OVERVIEW

- Fundamental changes in African systems of government are taking place. Democratic processes are taking hold. The need to decentralize authority and promote participatory approaches to natural resource management is broadly accepted. However, in many cases the ability of the State to play a lead role in social change is being eroded for a variety of reasons.
- Civil society's demand for transparency and good governance is growing and changing the course of development. It will take time to see the full impact of these changes.
- Continued population growth will result in an increase of about 388 million people by 2020. Some countries that are already densely populated and where the productivity of the land is low will be particularly affected by population growth, which could accelerate resource degradation, especially when opportunities for economic diversification are limited.
- Rapid urbanization means that almost 50 percent of the African population will live in urban areas by 2020.
- The HIV/AIDS pandemic will strain the resources of many countries, especially in Southern Africa.
- The small size of the formal economy and low per capita income in Africa will keep economic growth down to no more than 4 percent per year, which means growth in per capita income will be negligible.
- The highly uneven distribution of income and the extent of poverty are unlikely to diminish significantly during the next two decades.
- Except for a few countries, Africa is primarily dependent on agriculture and other land-based activities. Continued dependence on land and low levels of productivity will increase pressure on forest land.
- As globalization continues, Africa will continue to be influenced by developments beyond its borders. These will include changing trade patterns, regional and subregional economic integration, technological advances, private sector investment, debt, and development assistance.

Some authors indicate that decentralization and devolution of resource management responsibilities is expected to usher in a new era for forestry in Africa (see Alden Wily, 2000). While the broad direction of changes is evident, the pace has been somewhat uneven. Political and institutional changes take a long time and require systematic and sustained capacity building. Although most countries will advance in the general direction of increased democratization and greater involvement of people, the nature and timing of the changes remain unpredictable.

The consequences of these changes for forestry are far-reaching. In the past, most forests were owned by governments or local communities. Government control and management were introduced in the early years of colonization by establishing forest reserves, mainly to appropriate the more valuable resources and protect them from exploitation by others. Most of the forests and woodlands considered as less valuable were left to the control of local communities. Policies and legislation largely focused on maintaining centralized control of resources.

Many countries have amended their legislation to empower subnational entities to manage natural resources. While policy reforms are in progress, their implementation has been much slower. Some of the hurdles involved can be summarized as follows:

- decentralized bodies are more hampered than federal/national governments by limited resources. Hence, decentralization may not necessarily lead to improved management. Cash-strapped provincial and local governments have often resorted to overexploitation of forest resources to increase their income to support other activities;
- in general, forestry institutions are extremely weak in Africa, even under traditional centralized systems. Decentralization without concomitant strengthening of capacities could further weaken their ability to manage resources. Areas such as research, education and extension are particularly prone to neglect, especially when resources are limited;
- in countries where population densities are low and resources are relatively abundant, especially in Central Africa, the interest and ability of local communities to manage resources is uncertain. Furthermore, in most cases when forest resources are perceived to be valuable, governments have very little inclination to transfer management responsibilities to others. Participation is most often limited to sharing part of the income from logging, so that local communities simply share the spoils of unsustainable management;
- where local communities are involved in resource management, in the absence of strong institutional structures, local vested interests often dominate decision-making and decentralization has not helped to bring about a change in resource management with a view to meeting the larger interests of the communities. This is especially so when transparent democratic systems of resource use are not in place;
- where successful community participation has increased the value of forest resources, there have often been efforts to appropriate these resources from the communities under the pretext of fulfilling larger national interests.

BOX 11

OUTLOOK FOR COMMUNITY FOREST MANAGEMENT

It is reasonable to expect more difficulties in establishing collaborative schemes in resource-rich countries where reluctance to devolve power to local communities is more intense. For similar reasons community forest management will have a better chance to progress in resource-poor countries where often communities already have organized themselves to manage their scarce forest resources in more sustainable ways. In these latter cases, it is more likely that international assistance will be forthcoming. Project level initiatives are more likely to happen than sector-wide programmes.

(Contreras-Hermosilla, 2001)

Despite the above limitations, the potential benefits of decentralization and wider community participation in resource management are increasingly recognized. However, it is hard to predict whether there will be a smooth transition to greater community participation. Although efforts to promote community management began more than 20 years ago, the process has been very slow, and the extent of forests that have been transferred to and are managed by communities remain small. Some acceleration of the process may, however, be seen in the context of the changes taking place in the political and institutional arena. All the indications are that, at least in the near future, such developments will be largely confined to low-value forests in East, West and Southern Africa.

An interesting aspect of institutional development in Africa is the existence of traditional community organizations, although their importance is on the

decline. Traditional arrangements still govern the use of a substantial amount of land in Southern and East Africa. Introduction of the freehold system and the appropriation of the most productive customary land by colonial powers have altered traditional land use systems. Customary land is of critical importance to forestry, since it is a primary source of forest products for local communities. However, the weakening of traditional communal management systems has led to their degradation and depletion.

Private sector involvement

Another key institutional development in recent years is the increasing involvement of the private sector, largely arising from economic reforms implemented as part of structural adjustment programmes. In many countries, the role of the public sector is being redefined and governments are increasingly withdrawing from productive functions, transferring commercial and utility sectors to the private sector. Telecommunications, transport, power generation and distribution, and urban water supply are some of the areas being privatized.

Forestry has historically been a largely public sector pursuit. Political and institutional changes are now altering the situation, although the degree to which forestry has been commercialized and privatized varies. In many cases, the task of managing production has been entrusted to parastatal bodies, although the government still retains control over almost all aspects of management. However, in many cases the parastatal bodies have not made management any more efficient, justifying outright privatization as is happening in the case of forest plantations in some countries in Africa.

A major problem in this regard in Africa is the absence of a thriving indigenous private sector. This has to some extent led to the domination of foreign companies, especially in logging, processing and transport. Most private sector involvement is focused on areas or activities that yield relatively immediate benefits, such as logging natural forests, as opposed to longer-term investment, especially sustainable forest management. In recent years, wildlife-based tourism has become a major area for private sector involvement.

Increased private sector involvement is hampered by a number of factors, including the absence of a favourable institutional and legal framework and a level playing field. Land tenure uncertainties, weak legal frameworks and other constraints hinder the development of free and fair markets and a strong private sector. In sub-Saharan Africa, domestic private-sector development is relatively better developed in a small number of countries, such as South Africa, Ghana, Nigeria, Kenya, Zimbabwe and Senegal. North Africa with its strong business and trade links with several countries has a very vibrant private sector, especially in the forest industry.

Increasing civil society involvement

The recent years have seen the emergence of civil society organizations as an important actor influencing decisions relating to forest resource management in Africa. As democratic systems take root and the public at large becomes more conscious of their rights, civil society organizations are taking up issues like environmental degradation, transparency, accountability, etc. In Africa there are a number of active national and international civil society organizations addressing forestry issues. Apart from creating awareness, they have spearheaded action against illegal logging and trade of forest products, excision of forests and corruption. In fact the efforts of civil society organizations are compelling governments and other actors like logging companies to comply with the principles of sustainable management. As people become increasingly aware of their rights and responsibilities and access to information improves, the role of civil society organizations as a major corrective force is expected to grow significantly.

Resolving conflicts

Conflicts are inevitable in a continent of enormous cultural, ethnic, religious and linguistic diversity that is beset with poverty. At least some of the conflicts are a historical legacy of the way in which countries were divided, creating artificial political borders that ignored ethnic, economic, social, cultural and ecological links and continuities. In the absence of mechanisms to resolve these conflicts amicably, they become persistent and lead to civil strife and a complete breakup of society. Africa is currently experiencing a period of such conflicts, some of which spill across borders and undermine the development process.

In all the five African subregions there are internal or cross-border conflicts that sap the energy and resources of countries and reverse the process of social and economic development. The direct effects on forests include:

- illegal logging and exploitation of other forest resources to support these conflicts, with

systematic forest management being out of the question in such areas;
- extensive uncontrolled mining;
- the displacement of large numbers of people, with deforestation and resource degradation being serious problems in and around refugee camps.

Resolution of these conflicts will undoubtedly be a key factor in the future of African economies. Efforts are already under way to develop institutional mechanisms to address problems and resolve some of the longstanding conflicts in the Congo basin, Angola and the Sudan. There is considerable awareness that the resolution of conflicts is a vital precondition for fostering social and economic development in Africa. However, as some are resolved, new ones (for example Côte d'Ivoire) have emerged undermining social and economic development.

DEMOGRAPHIC CHANGES

Africa is undergoing rapid changes in population growth, distribution, age structure, etc., all of which will directly and indirectly affect forests and forestry. Some of the areas of change and their likely effects are indicated below.

Population growth

Population growth is undoubtedly one of the most critical factors that could alter the pattern of forest resource use. Between 1980 and 2000 the population of Africa grew from 469 million to about 798 million. By 2020 it will increase to an estimated 1 186 million, an addition of more than 388 million people (African Development Bank, 2000). Africa's current annual population growth rate of 2.4 percent essentially cancels out a significant proportion of GDP growth. Although the population growth rate is declining, it is still far from reaching the stabilization stage witnessed in a number of other regions.

There are considerable variations in population size among countries, and these affect forests and forestry in a number of ways. Nigeria, with a population of more than 127 million, is the most populous country in Africa. Egypt, Ethiopia, the Democratic Republic of the Congo and South Africa all have populations of more than 40 million, while there are several countries with fewer than 5 million people. Population size and density have major consequences for both the intensity of resource use and the size of markets.

Population density variations among ecological regions in Africa have major consequences for forestry.

TABLE 3
Population changes in Africa

Subregion	1980 (million)	1990 (million)	2000 (million)	2010 (million)	2020 (million)
North Africa	108.6	140.2	170.4	208.8	239.0
East Africa	104.5	141.2	182.1	230.0	289.0
Southern Africa	69.5	89.7	113.4	128.7	150.2
Central Africa	54.4	73.6	97.9	127.0	163.8
West Africa	132.2	177.8	234.0	277.6	344.0
Total Africa	**469.2**	**622.5**	**797.8**	**972.1**	**1 186.0**

Source: World Bank, 2002; African Development Bank, 2000.

Large tracts of Africa are arid and semi-arid, limiting the productivity of land, and hence its carrying capacity. Population densities thus range from less than five people per square kilometer in the desert areas of North and Southern Africa and less than ten people in some of the countries in the tropical rain-forest belt in Central Africa, to more than 50 people per square kilometer in West Africa and more than 200 people in Rwanda and Burundi. Population density is highest in the island countries. For example, Mauritius has an average population density of about 600 people per square kilometer.

Patterns of resource use within countries are influenced by the uneven population distribution. For example, almost 80 percent of the Ethiopian population lives in the Central Highlands, an area covering less than 30 percent of the country. The situation is similar in Kenya and Eritrea. The coastal areas of West Africa are more densely populated than the interior, and this has major consequences for the demand and supply of forest products as well as a host of other issues. In absolute terms, population growth is much higher in densely populated areas, and this is likely to exacerbate resource use conflicts by 2020.

Several other demographic factors will particularly affect forests, the foremost of which are:
- urbanization;
- the impact of HIV/AIDS;
- the changing population structure;
- movements of people within and between countries as a result of conflicts and natural disasters.

Urbanization

The perception that urban areas offer better opportunities, coupled with the poor economic prospects and often increased insecurity of rural areas as a result of conflicts, is a major factor contributing to rural-urban migration. Between 1990 and 2000 the urban population in Africa grew at an annual rate of 4.3

percent, much higher than the overall population growth rate, largely as a result of rural-urban migration. Approximately 646 million people will be living in urban areas in 2020, compared to 302 million in 2000. The extent of urbanization will vary considerably among the various subregions. North Africa, where nearly 51 percent of the total population lives in cities, is the most urbanized subregion of the continent. East and Central Africa are the least urbanized, with about 24 and 31 percent respectively of their populations in cities. Both West and Southern Africa are about 40 percent urban, a proportion expected to reach more than 51 percent by 2020.

Economic change and the extent to which people remain directly dependent on land will determine the overall impact of urbanization on forests. Most studies indicate a growing demand for construction timber and, more important, woodfuel. Peri-urban areas in particular will come under increasing pressure, especially to meet the growing demand for biomass energy and agricultural land. The increasing proportion of charcoal consumption in total woodfuel use in Africa is a reflection of urbanization and has major consequences for resource degradation, especially in areas close to urban centres.

The growth of large cities in Africa is a critical issue confronting planners and policy-makers, especially considering the present trends. There are only two cities in Africa today with over 10 million people – Lagos and Cairo. By 2015 Lagos will have a population of about 16 million, becoming the eleventh most populous city in the world. During the same period, Cairo's population will have grown from 9.5 million to 11.5 million. The populations of several other cities will also have grown significantly, straining urban infrastructures. In addition to meeting demands for various forest products (especially woodfuel and construction materials), forestry will be required to play a major role in improving the urban environment.

Impact of HIV/AIDS

Several studies have highlighted the severe impact of the HIV/AIDS pandemic on African economies. Of the 45 highly affected countries in the world[10], 35 are in sub-Saharan Africa (United Nations, 2001). All the most severely affected countries are in Africa: Botswana, South Africa, Swaziland and Zimbabwe[11]. HIV/AIDS will reduce life expectancy in these countries to an average of 39 to 50 years between 2010 and 2015, from the average of 67 to 73 years it would have been, were HIV/AIDS not a factor.

HIV/AIDS will have a variety of effects on forests and forestry. The most direct impact will be through a reduction in the number of skilled and semi-skilled workers available. AIDS has already killed about seven million agricultural workers in the 25 hardest-hit African countries. Another 16 million could be lost by 2020 (FAO, 2001b). Lack of agricultural investment and skilled workers will undermine agricultural development, and this could affect forests and forestry in a number of ways, including increased dependence on some forest products that are easily gathered and require very few inputs. Productivity will be significantly affected and technological progress hampered. As governments and families have to spend more money on health care, fewer financial and human resources will be available for investment. The impact of the current level of infection will persist for the next two decades, undermining capital formation and jeopardizing the transfer of knowledge between generations.

Governments will be compelled to use their limited resources for health care and AIDS prevention efforts, reducing the availability of resources for other sectors. Human capital degradation will undermine technological progress in forestry and forest industries. Already several forestry professionals and technicians have succumbed to the disease. Maintaining and improving the situation will require large investments in human resource development, exactly when caring for those affected demands significant resources. Countries such as South Africa, which has the potential to become one of Africa's major growth centres, is already experiencing a drastic erosion of human capital[12].

Changes in the age structure

A key feature of African demographic change is the growing proportion of young people. Almost all African countries, with the exception of those in North Africa and Southern Africa, have more than 40 percent

[10] Those with 2 percent or more of their population aged 15 to 49 affected.

[11] In Botswana, the country with the highest HIV prevalence, one out of every three adults is HIV-positive and life expectancy dropped from 60.2 years between 1990 and 1995 to 44.4 years between 1995 and 2000, and is forecast to fall further to 36 years between 2000 and 2005.

[12] In 2000, 24.5 percent of the adult population of South Africa was affected by HIV/AIDS. According to one estimate, this will result in a population decline from 43.4 million in 2000 to 38.7 million in 2015.

of their population in the under-15 age group (United Nations, 2001). In some countries, such as Uganda, this proportion is as high as 49 percent. Within the next two decades, Africa will thus have a large proportion of young people, affecting the structure of the workforce and the demand for goods and services. The changing perceptions and aspirations of this young society will have far-reaching consequences for the economy. Although agriculture will continue to be important, there will be an increasing shift away from land-based activities, especially if other opportunities emerge.

Movement of people within and between countries

The African population is more mobile than that of any other developing region. National borders have always been porous. Climatic variability has compelled regular movement, as in the case of pastoralists in large parts of the Sahel. In recent years, conflicts and natural disasters such as drought have caused temporary or permanent population movements within and between countries. These have resulted in land use changes, often intensifying land use conflicts and degradation in areas where displaced people find refuge.

Some of the recent population assessments indicate a reduction in the number of nomadic pastoralists, with many changing to sedentary pursuits. Other factors, mainly economic, are contributing to an increased movement of people between countries. Several African countries are losing highly qualified people, including forestry professionals and technicians, thus undermining economic development. Mobility has its advantages and disadvantages. It is generally a reflection of the absence of stable income-earning opportunities. A highly mobile population is unlikely to make any long-term investment in sustainable resource management.

ECONOMIC CHANGES

Historical experience clearly suggests strong links between overall economic conditions and the state of forests, and the limited evidence from Africa corroborates this. Changes in income, its distribution, and the role of the various sectors in providing income, employment and basic needs directly affect people's priorities. It is therefore necessary to examine the economic prospects in order to understand what may happen to forests and forestry in the next two decades.

Gross domestic product and its growth

Although often imperfect, GDP and its growth rate are used as major indicators of economic progress, especially

BOX 12

DISPLACED PERSONS IN AFRICA

There are today about 7.3 million refugees assisted by UN agencies in Africa – almost 3 million more than 1990. Africa has more uprooted people relative to the population (1.06 percent in 1997) than any other major world region and in absolute numbers almost as many as the whole Asia Pacific Region. Today, six of the ten countries 'producing' most refugees are African.

(African Development Bank, 2000)

FIGURE 2

GROSS DOMESTIC PRODUCT – AFRICA AND THE WORLD

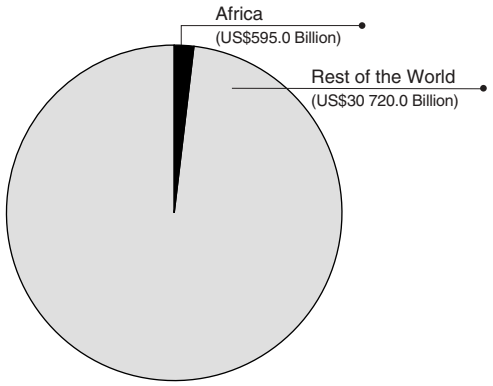


FIGURE 3

SHARE OF THE DIFFERENT SUBREGIONS TO THE AFRICAN GDP

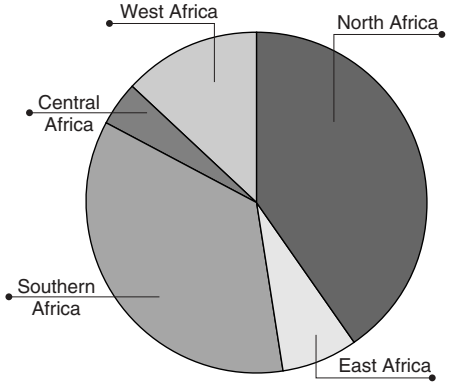


TABLE 4

Gross Domestic Product – World, Africa and the subregions

Area	2000 GDP (US$ billion)	Percentage of global GDP (%)	Percentage of global population (%)
World	31 315.0		
Africa	595.0	1.90	13.2
North Africa	237.1	0.76	2.8
East Africa	42.5	0.14	3.0
Southern Africa	207.4	0.67	1.9
Central Africa	31.3	0.10	1.6
West Africa	76.7	0.24	3.9

Source: World Bank, 2002.

in making intercountry comparisons and drawing broad conclusions on the overall situation in a given country. While GDP provides the aggregate value of all goods and services produced in a country, per capita income is a rough indicator of the individual's purchasing power. In 2000, the total GDP of Africa was estimated at just over US$ 595 billion. This represents less than 2 percent of the global economy, although Africa has about 13.2 percent of the world's population.

This aggregate figure conceals significant differences within Africa. South Africa, which has a population of about 43 million, accounts for 29 percent of Africa's GDP. When the aggregate figure is adjusted to allow for the influence of the relatively prosperous countries of North Africa, it can be seen that the GDP for most of sub-Saharan Africa is extremely low. Savings, investment and growth naturally suffer in these countries.

Another feature of African economic development is the slow GDP growth rate (see Box 13). The growth rate was negligible in the first half of the 1990s, and even negative in some cases[13]. Some countries experienced positive growth rates during the second half of the 1990s, although it is too early to say whether this represents a long-term trend. The recovery is very fragile because of the low rates of savings and investment (ECA, 2001b). All the indications are that real GDP growth rate during the next two decades is unlikely to exceed 4 percent per annum.

TABLE 5

Average annual GDP growth in Africa 1965–2000 (%)

	1965–1969	1970–1979	1980–1989	1990–2000
Africa	4.5	4.2	2.5	2.6
North Africa	5.3	6.7	4.2	3.2
sub-Saharan Africa	2.4	4.0	2.1	2.3

Source: United Nations Conference on Trade and Development, 2001; World Bank, 2002.

BOX 13

OUTLOOK FOR ECONOMIC GROWTH IN AFRICA

Estimates of economic growth for Africa suggest a modest growth during the next two decades. During 1990-2000, the African economies grew at the rate of 2.6 percent per annum. As per a recent assessment of the World Bank, real GDP growth in sub-Saharan Africa is estimated to grow at 2.7 percent in 2002, 3.9 percent in 2003 and 3.7 percent during 2004-2010. With a projected population growth rate of 2.2 percent, real per capita income will average 1.5 percent till 2010. In the case of Near East and North Africa, the real GDP growth is projected as 3.3 percent till 2010.

Another long term estimate puts sub-Saharan real GDP growth rate at 4.4 percent during 1997-99 to 2015 and 4.5 percent during 2015-2030. For the Near East and North Africa the projected growth rates during the above periods are 3.7 percent and 3.9 percent.

Income distribution and poverty

Low per capita income combined with a highly uneven income distribution leads to high poverty rates in Africa. In sub-Saharan Africa as a whole, the bottom 40 percent of the population has only 11 percent of the income, while the top 20 percent has 58 percent of the income. Some extreme cases of highly unequal income distribution, often stemming from historical factors such as land appropriation during colonial periods, are yet to be addressed.

Fifty-two percent of all Africans live on less than US$ 1 per day (ECA, 2001b). In 1998, the rural poor spent an average of US$ 14 per month, while the urban poor spent an average of US $27 per month. Rural poverty is estimated at 59 percent, whereas in urban areas it is 43 percent. In countries such as Sierra Leone and Zambia, about 68 percent of the people live below the poverty line (ECA, 2001b). Even in a middle-income country such as South Africa, with a per capita income of more than US$ 3 000, 45 percent of the population lives below the poverty line. Poverty is also reflected in other human development indicators. Of the 49 countries with a mortality rate of more than 100 per 1000 children under five, 37 are in sub-Saharan Africa (United Nations Children's Fund, 2001).

Poverty has several consequences for forests. People will continue to depend on forest resources, but may not be able to invest in managing them sustainably. This is especially so when land tenure is uncertain, thereby discouraging investment and encouraging actions that maximize short-term benefits.

Sectoral shifts in income and employment

Sectoral shifts in income and employment critically affect the scope for protection and sustainable management of forest resources. The share of value added by the agricultural sector fell from about 40 percent in the period 1960 to 1968 to about 21 percent in the period 1990 to 1998. The change in the share of value added in the industrial sector was negligible, rising from 26 percent in the period 1960 to 1968 to just under 30 percent in the period 1990 to 1998 (ECA, 2001b). Most growth has been in the services sector,

[13] At an aggregate level during the period 1990 to 1999 several countries (Angola, Burundi, the Democratic Republic of the Congo, Lesotho, Rwanda, Zambia and Zimbabwe) had negative GDP growth rates.

but in the long term the low growth in the agricultural and industrial sectors limits the prospects of growth in the services sector.

Limited industrialization means continued dependence on land and the service sector of the economy. As the population continues to grow, subsistence cultivation is likely to expand, with its adverse impact on forests and woodlands. Some countries, such as Angola, Botswana, Gabon, Equatorial Guinea, Namibia, Nigeria and Zambia, have thriving extractive industries based on oil or minerals. However, the benefits of growth in these areas are not widely available, necessitating continued dependence on agriculture and other allied activities.

Agricultural development

Africa is still largely an agrarian economy, and its economic performance is therefore intimately linked to the performance of the agricultural sector. Agriculture produces the bulk of the food consumed in Africa and accounts for 70 percent of total employment and 20 percent of all merchandise exports. It is also the main source of raw material for industries. Nearly two-thirds of manufacturing value added in most African countries is based on agricultural raw material (FAO, 2000).

Unfortunately, the performance of African agriculture has been far from satisfactory. Both the subsistence sector (producing most of the cereals) and the commercial sector (producing most of the cash crops) have faced problems, especially declining production and productivity, and, in the case of cash crops, a significant reduction in prices. A recent FAO study points out that "*Africa is the only region in the world where the regional average of food production per person has been declining over the past 40 years, putting large segments of the population at risk from food insecurity and malnutrition*" (FAO, 2000).

An important aspect of agricultural development with a direct bearing on forestry is how future increases in production are to be achieved, and especially whether this takes place by cultivating new areas or by improving productivity. Past increases in production have come about largely by bringing more land under cultivation (FAO, 2000). Although 75 percent of future production gains will come from increased productivity and only 25 percent from clearing new land, this is critically dependent on a variety of factors, including significant improvements in technology, access to inputs, development of infrastructure and, more important, favourable tenure reforms[14]. In the absence of significant developments in these areas, forest clearing will remain an important option for agricultural expansion.

Thus, all the indications are that dependence on land will continue into the foreseeable future, except in a very few countries where other sectors, especially industry, mining and tourism, have grown rapidly. However, these instances are very few and there have been very limited structural changes and diversification of economies. In some countries diversification has been based on the exploitation of minerals and oil. In these instances, the benefits have not percolated to the people and have largely enriched a small segment of the population. Although the aggregate economic situation in the form of per capita income and balance of payments has improved, such developments have thus generally been enclavist, with the majority of the people benefiting little from them. Dependence on land is therefore expected to persist, accentuating land use conflicts and continued degradation and loss of forests.

Growth of the informal sector

A key feature of African economic transition is the rapid growth of the informal sector, both in rural and urban areas. A number of studies have highlighted the "de-agrarianization" of Africa, involving a shift from peasant agriculture to a diverse range of activities (Bryceson, 1999). Decreasing income from export crops and increasing need for cash have caused this transition. Charcoal production, pitsawing, the transport of wood and wood products, and the collection and marketing of non-wood forest products are some of the major informal sector activities that have grown rapidly. Considering that the formal sector is unlikely to grow enough to absorb the labour force, the informal sector will continue to play a major role. The low capital and skill requirements make entry to and exit from the informal sector easy. However, this also imposes limitations, especially on long-term investment and technological improvement. Many informal sector activities are considered "illegal", which is a strong disincentive for any investment. There are, however, some signs of increasing commercialization of some segments of the informal forest product sector (Kowero *et al.*, 2001). Some items, for example wood carvings

[14] The FAO study highlights the issues involved in input use in African agriculture, pointing out that it "remains the least productive and one of the lowest users of modern inputs in the world" (FAO, 2000).

from West and East Africa, are even being sold in Southern African and on overseas markets, although the benefits that actually accrue to the producers may not be significant, since several intermediaries are involved before the products reach consumers in distant markets.

Impact of economic liberalization

Many African economies have been liberalized for quite some time and are often more so than those in other continents. While liberalization has provided new opportunities for trade, it has also had an adverse impact on local industries (see Box 14). Cheap imports have undermined markets for many local products, and liberalization has not improved terms of trade. Agricultural subsidies in many developed countries have undermined the prospects of increased exports from Africa. Although exports of certain products have risen, increased imports mean that the balance of payments has not improved, and has even worsened in some cases.

There are several constraints in taking full advantage of the opportunities offered by economic liberalization, including fragmented markets, long distances and poorly developed infrastructure, a historical focus on a few export-oriented cash crops, and a lack of human resources and skilled labour. Experience to date suggests that the benefits of economic liberalization largely accrue to a relatively few people, often worsening the already unequal distribution of income.

In the forest sector, liberalization has increased investment in logging and related activities. The problem is that governments have a very limited capacity to manage and control such investment, resulting in the loss of potential benefits.

This situation is applicable not only to timber, but also to the more valuable non-wood forest products including medicinal plants, which are being exploited without due consideration for their sustainability. Investment in wildlife-based tourism is also increasing, but here again there are no reliable estimates on the benefits that accrue to countries or local communities.

BOX 14

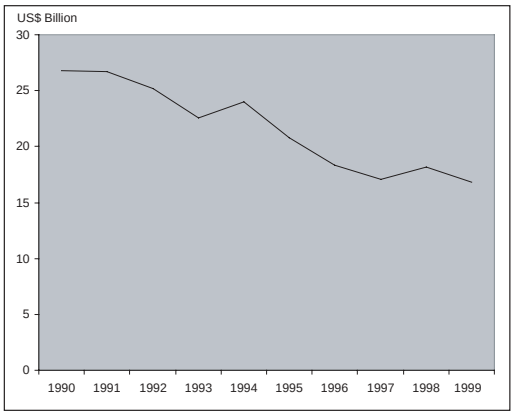
SOME EFFECTS OF LIBERALIZATION

Since the region is one of the most open regions in the sense that international trade is large relative to GDP, the effect of more rapid liberalization might be less than in other regions. Since the world market share for most of its traditional exports is already declining, as a result of stiff competition from the rest of the developing world, faster liberalization would accelerate the decline. It is unlikely that the region can produce as cheaply as some Asian countries because of higher labour and transaction costs. Even high-quality products of speciality markets (e.g. biologically grown Arabica coffee and cocoa) are likely to be affected as competitors will tend to pursue the same market niches. The tree-crop system would be the most affected by these changes.

(FAO & World Bank, 2001)

FIGURE 4

CHANGES IN NET ODA TO AFRICAN COUNTRIES



Source: World Bank, 2002.

Foreign direct investment

Investment from external sources is critical when countries are unable to mobilize resources internally. Worldwide, as in Africa, there has been a significant decline in official development assistance(ODA). Although foreign direct investment (FDI) to developing countries has increased, the increase for

TABLE 6

FDI Flows to Africa and developing countries

Group	1980	1990	1995	2000
	(US$ billion)	(US$ billion)	(US$ billion)	(US$ billion)
Developing countries in Africa	0.40	2.51	4.69	8.20
All developing countries	8.26	37.25	113.34	240.17
World	54.72	202.30	331.07	1 270.76

Source: United Nations Conference on Trade and Development, 2002.

BOX 15

IMPACT OF STRUCTURAL ADJUSTMENT PROGRAMMES: EXPERIENCE OF CAMEROON

Cameroon has no reliable national food crop statistics, but more limited survey and case study data suggest that forest clearing for food crops and forest degradation through unmanaged harvesting of fuelwood and non-timber forest product extraction increased under structural adjustment.

(Kaimowitz *et al.*, 1998)

Africa has been negligible. For example, between 1980 and 2000 the total FDI to all developing countries increased from US$ 8.26 billion to US$ 240.17 billion, but Africa's share in this was only US$ 0.40 billion in 1990 and US$ 8.20 billion in 2000 (United Nations Conference on Trade and Development, 2002). Furthermore, most of the FDI flows are destined for a small number of countries, with most of the investment going to extractive sectors. For example, Angola and Nigeria accounted for about 34 percent of the FDI, most of it going to oil exploration, production and refining, almost entirely controlled by multinational companies.

Except in South Africa, most forest-sector investment has gone to logging and wood processing. Despite the high rates of return on FDI in Africa[15], investment has remained low on account of the perceived risks involved in investing there.

In a globalized economy, FDI flows will primarily be based on the expected rates of return and the perception of risk. Increasing competition from other countries with lower risks and higher returns will keep the FDI flows to Africa at a modest level. Most FDI is likely to focus on high-return investment in a very limited number of countries. As is already evident, in the forest sector, logging and associated processing will be the main areas for such investment.

External debt

The massive debts of African countries will undoubtedly be one of the major factors affecting forestry in the region. The total external debt of African countries in 2000 was estimated at US$ 298 billion, or about 50 percent of the GDP at current prices. Several countries have debts more than double their GDP, and most of their export income services these debts. With such high debts, the ability of most governments to invest in economic development is low. There is a strong incentive to use forest resources to generate the income required to pay off debts, as well as to support development efforts in other priority sectors. Ongoing debt relief measures targeting highly indebted countries may have some impact on forestry, although their long term effects are yet unclear.

Global and regional changes affecting forests and forestry

As the pace of globalization accelerates, events in Africa will be increasingly influenced by developments outside the region. Trade, investment and technology are all changing as Africa becomes more integrated into the global economy. While economic integration increases opportunities, it also subjects Africa to global economic turbulence. In addition to membership of the World Trade Organization, most countries are also members of one or more subregional organizations aimed at enhancing cooperation in trade and allied areas.

Emerging trade patterns

The impact of trade liberalization on forests in Africa will be both direct and indirect. Historically, Africa has mainly exported primary products, including minerals and other extractives. Global developments, especially as they affect the price of African exports, will have a far-reaching indirect impact on forestry[16]. The following are some of the changes that could have an impact on forestry and the forest industry in Africa:

- *global demand and supply.* With modest demand growth and no significant supply changes, there will be no significant global wood deficit during the next two decades, although there may be local shortages. The price of tropical logs, including those from Africa, is therefore unlikely to increase. Since supplies from other sources, especially Russia and other East European countries, will grow, the prospects for increased exports from Africa are limited. The recent global economic slowdown is also expected to have a negative impact, by depressing demand;
- *emergence of new markets.* Historically, most log exports from Africa have been destined for Europe. This is changing as a result of declining consumption and the emergence of new markets in Asia, especially China and India;
- *global wood production.* A major factor that will affect the viability of forest plantations in Africa will be the increase in wood supplies from plantations elsewhere, especially in the Asia and Pacific region. There has been substantial investment in plantations in the Asia and Pacific region as well as in Latin America over the past ten years, and some predict a major surge in wood supplies from these plantations, resulting in a drastic decline in wood prices. This situation could seriously erode the commercial

[15] United States FDI in Africa averages rates of return of more than 25 percent. In all developing countries it ranges from 14 percent to 17 percent.

[16] Declining prices have made further expansion of these crops uneconomical. Deforestation could therefore slow down. However, there may be other indirect effects, since reduced income encourages forest clearing for subsistence cultivation, or increases other pursuits such as charcoal production and illegal logging.

viability of plantations in Africa, unless substantial efforts are made to increase productivity.

Regional and subregional economic integration

Efforts to step up regional and subregional economic integration will also have direct and indirect consequences for forestry. The recent establishment of the African Union, replacing the erstwhile Organization of African Unity, suggests the growing commitment to regional integration. A well-integrated Africa would significantly alter the economic scenario stemming from increased intercountry cooperation. However, it is hard to forecast the pace of change, especially considering the complexity of the integration process. A number of subregional organizations, often with overlapping coverage, already exist to strengthen cooperation among their member countries[17]. On the initiatives of these bodies, several instruments of economic integration, specifically focusing on unifying and reducing duties and on cooperation in such areas as power supplies and water sharing, have been developed. Since most countries have joined the World Trade Organization, further liberalization of trade is expected.

Attempts to increase regional and subregional integration will have to address potential conflicts of interest. Currently the proportion of intraregional trade is very small. The basket of traded goods produced tends to be somewhat similar, and increased trade implies that African countries will be competing with each other within and outside the region. The pace of regional and subregional integration will depend on the extent to which countries are able to obtain the long-term benefits of such collaboration and integration and how short-term negative impacts are addressed.

The impact of improved regional and subregional integration on forests and forestry could be substantial, provided other necessary conditions emerge. For example, the forest-rich Central Africa could become an important source of wood supply to the forest-poor subregions. There is already some timber trade, both legal and illegal, between Central Africa and other subregions. Further expansion of trade will depend on improvements in infrastructure and, more important, increased purchasing power. While such potential exists, in a more liberalized environment wood and wood products from Africa will have to compete with products from outside the region. In many African countries imports from outside Africa already have a negative impact on local wood industries. While many are closing down, some may be compelled to modernize and enhance their efficiency.

BOX 16

STATE OF FOREST RESEARCH IN SUB-SAHARAN AFRICA

In an age where human skills and capacity to harness technology for development is the fundamental basis for generating wealth and prosperity, this weakness threatens the very future of Africa. The forestry sector reflects the general situation. With few exceptions, mostly to do with South Africa, research capacity is mainly weak and dispersed; human scientific skills are patchy; the stocks and flows of new knowledge are low; and organization of research and related education leave much to be desired. Furthermore, there is no culture that places research and systematic enquiry at the core of development planning and policy making.

(Kowero *et al.*, 2001)

TECHNOLOGICAL CHANGES

Technological change is a key adaptive response of a society to an increasing population. The rapidly growing human population could not have been supported without rapid advances in agricultural and industrial technology. It is hence important to consider the overall changes in technology, more specifically examining how forestry in Africa is able to innovate and adapt new technology in response to the increasing demand for goods and services.

Global changes

The past two decades have been characterized by rapid developments in a range of technologies. The effects of such developments include:

- improved access to information and the ability to monitor resources;
- reduced demand for raw materials as a result of improvements in materials technology;
- increased emphasis on renewable energy sources and cleaner energy technologies;

[17] Some of the most important of these are the Common Market for Eastern and Southern Africa (COMESA), the Economic Community for West African States (ECOWAS), the Economic Community for Central African States (ECCAS), the East African Community (EAS), the Communauté économique et monetaire de l'Afrique Centrale (Economic and Monetary Community of Central Africa – CEMAC), the Communauté économique des pays des Grands Lacs (Economic Community of the Great Lakes Countries – CEPGL), the Intergovernmental Authority on Development (IGAD), the Union économique et monétaire ouest-africaine (West African Monetary and Economic Union – UEMOA) and the Southern African Development Community (SADC).

- improved transportation technology, enabling the faster movement of products and people;
- the application of biotechnology to agriculture, forestry and animal husbandry, thus contributing to higher productivity.

Within forestry, technological changes have led to:

- utilization of more tree species;
- improvements in wood processing, including recycling, reducing raw material requirements and the use of small-dimension logs;
- processing and materials technology, making species differences less important;
- improvements in environmental standards, making it necessary to adopt processes and technologies that are less harmful to the environment;
- tree improvement and biotechnology, leading to higher productivity, especially in the case of plantations;
- new products and processes that increase the potential of non-wood forest products, including medicinal plants.

Technological changes in African forestry

While developments in science and technology at the global level indicate the potential, whether these will find ready adoption and wider application in Africa during the next two decades is a moot question. To a large extent, this reflects the overall deficiencies in the capacity of the countries, first to invest in research and development relevant to the needs of the people, and second to adapt what is available from elsewhere to the country's needs. This stems in part from the limited scientific and technological capacity in Africa and weaknesses in science education (see Box 16). Most technological developments will be confined to a few countries or limited to a small segment managed primarily by the private sector.

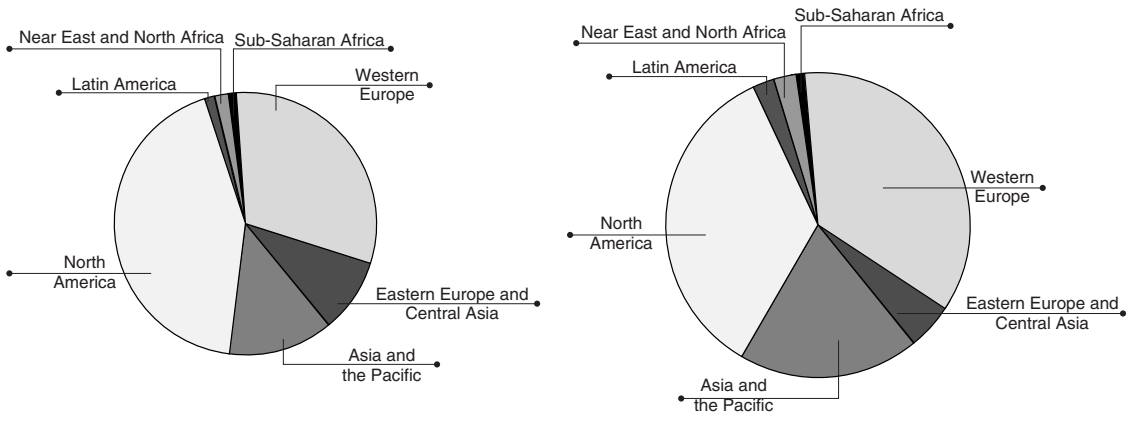
The very low rate of innovation and adoption of technology in Africa is a major issue. Although there is a strong fund of traditional knowledge, which forms the basis of most subsistence production, there has been very little investment in research and development, except in a few countries such as South Africa.

Most agricultural research in Africa has focused on cash crops. As income from such crops has decreased, agricultural research has been neglected. Although a number of international institutions are researching key African crops, including cereals and tubers, the absence of appropriate national systems has meant that the adaptation of research to local needs has been minimal. In recent years, structural adjustment programmes have further weakened national capacities to undertake research and development. There is no indication that the private sector is likely to fill the vacuum, since it is largely active in very limited areas of research with proven commercial potential.

Forestry research and development institutions in Africa are generally weak and suffer from structural, technical and financial problems. They are also highly dependent on external support, which has decreased in recent years. Except for South Africa, which has a strong private sector research system supported by the wood products industry, forestry research in most countries has not made any significant progress and has often declined in the level of efforts and the quality of outputs.

If past trends are any indication, Africa will continue to use technology developed elsewhere, but access to this technology will decrease because of resource limitations. The technological divide that exists today

FIGURE 5
NUMBER OF SCIENTIFIC ARTICLES GLOBALLY AND IN AFRICA - 1996 AND 2000



Source: National Science Foundation, 2002

between Africa and the rest of the world (see Figure 5) and within Africa between the more organized and the less organized sectors are therefore likely to persist and widen.

ENVIRONMENTAL CONCERNS AND THEIR IMPACT ON FORESTRY

Unlike the situation faced by other continents, African economic development is taking place in a period of heightened environmental and social awareness. The interest of global stakeholders in environmental and social issues is particularly strong. Apart from the strong links between poverty and environmental degradation, emphasis is being given to the broader implications of protecting biological diversity and controlling desertification, and, more important, the relationship between forests and climate change. The United Nations Conference on Environment and Development (UNCED) and various post-UNCED initiatives, particularly the conventions relating to biodiversity, desertification control and climate change that have been ratified by most countries, are directly relevant to forestry. However, the ability of many African countries to allocate resources to adhere to these commitments is limited. The following elements are particularly relevant to forestry in Africa:

- *establishment of protected areas.* The extent of protected areas in Africa has increased during the past few years and currently accounts for 6.6 percent of the land area. Substantial support for the establishment and management of protected areas has come from donor agencies and, in some cases, the private sector. Without such support, many of the present protected areas would not exist, although this raises the issue of the long-term sustainability of such efforts. There are many areas that do not receive adequate protection, making them nothing more than "paper parks";
- *sustainable forest management.* Maintaining the productivity and integrity of ecosystems is a growing concern. There have been many global and regional initiatives to develop criteria and indicators of sustainable forest management and to adopt them at the country level. Although the capacity for sustainable forest management still remains far from satisfactory, efforts in this direction will continue and increase;
- *certification and labelling.* Certification and labelling initiatives have largely originated with consumer movements in Europe and elsewhere. Africa has nearly 1 million ha of certified plantations, mostly in South Africa. Certification has been a strategy to maintain market leadership, especially in niche markets catering to the demands of discerning consumers. However, growth in this area is uncertain, especially on account of the changing direction of the forest product trade;
- *climate change issues and the role of forests as carbon sinks.* With the recognition of forests as carbon sinks there is some expectation that more resources may be available to support reforestation and afforestation activities. There are already some pilot projects in some countries in Africa. The present diluted form of the Kyoto Protocol is unlikely to stimulate sufficient carbon credit trading to attract substantial investment in reforestation and afforestation in Africa, particularly in view of the limited availability of high-productivity land, the uncertainty of land tenure, and political instability. The predominance of low-productivity land suggests that most of Africa will be on the margins as far as establishing carbon sink forestry projects are concerned.

The recently concluded World Summit on Sustainable Development reiterated the need for concrete action on the decisions of UNCED, stressing in particular the need to give priority to water, energy, health, agriculture and biological diversity. While no time frame was stipulated, the summit urged the importance of addressing critical issues such as water and sanitation. There have also been a number of partnership initiatives, the most important for African forestry being the Congo Basin Partnership Programme. While it is hard to forecast the long-term effects of these initiatives and whether all of them are likely to result in a radical departure from the past, they represent major steps in developing a balanced approach to resource use. Most important, the links between poverty and environmental degradation have received greater prominence.

CONCLUSION

There are several factors driving changes in African forestry. Although their effect is sometimes indirect, the most fundamental of these are political, social and institutional changes, especially the emergence of democracies, the decentralization of administration, the increasing emphasis on transparency in the affairs of the public and private sectors, and the growing role of civil society in pursuing issues such as the protection of the environment. Ongoing efforts toward wider

adoption of participatory approaches in resource management are expected to gain momentum during the next two decades. There is, however, concern that the weakening of States will erode the capacity of the public sector to address critical social and environmental issues.

Developments on the political and institutional front have to counter various negative factors, including high population growth rates, low income levels, the high incidence of poverty, the social and economic effects of HIV/AIDS, low levels of economic diversification, and a poor science and technology capacity. These factors in a way reflect the adverse political and institutional environment of the past, and they could possibly change for the better, depending on the breadth and depth of ongoing political and institutional changes. If this does take place, the development of forests and forestry is likely to move to a very different level. On the other hand, persistence of the business-as-usual approach would lead to a deterioration of the situation. The possible scenarios that may emerge in the next two decades are discussed in the following chapter.

Chapter 4

Future scenarios

A range of forestry scenarios can be visualized, depending on how countries and people take advantage of emerging opportunities and overcome constraints. The range of possibilities is determined by the options available to the various actors. These actors include forest-dwellers, forest fringe communities, large and small farmers, pastoralists, local entrepreneurs, corporate investors from inside and outside the country, government organizations, local and international non-governmental organizations, bilateral and multilateral organizations, and citizens' groups.

Options available to the various actors vary depending on the path of development pursued. As indicated in Chapter 3, various factors affect the forest sector both directly and indirectly. Many of these factors operate through various actors whose responses to the forces of change are influenced by the institutional environment in which they function. It is therefore appropriate to examine the alternative scenarios in the context of changes in the policy and institutional environment and how these affect forests and forestry as the various actors respond to changing opportunities and constraints.

DEFINING THE SCENARIOS

Various approaches are available for defining scenarios. The most commonly used ones rely on econometric modeling, taking into account variables such as population and income changes. However, they seldom permit the consideration of qualitative changes, especially those stemming from political and institutional developments. Some recent efforts at scenario planning have attempted to include qualitative elements, one of the most notable being that of the Stockholm Environment Institute (see Gallopin *et al.*, 1997). This approach to scenario definition has also been adopted by the United Nations Environment Programme in preparing the Global Environment Outlook report and the African Environment Outlook report (United Nations Environment Programme, 2002). In view of its advantages in bringing political, social and institutional issues to the fore, the same approach has been adopted by FOSA, with appropriate modifications (see Box 17).

Public sector dominance has been the most prevalent institutional framework in Africa. Under it, the key responsibilities for managing the economy are assumed by the government, which not only regulates the development of all key economic sectors, but is also quite substantially involved in the forestry sector. In addition to direct involvement in resource management through logging, processing, trade, research, education and training, governments are also responsible for the formulation of policies and legislation that define the nature of action by other actors.

In recent years, the role of the public sector has been intensely scrutinized. Its alleged economic inefficiency,

BOX 17

GLOBAL SCENARIOS: THE SEI FRAMEWORK

The Stockholm Environment Institute (SEI) established a Global Scenario Group to engage a diverse group of development professionals in identifying global and regional scenarios, policy analysis and public education, specifically focusing on requirements for sustainability. An important publication of the Global Scenario Group is *Branch points: global scenarios and human choice* (Gallopin *et al.*, 1997). The SEI approach to scenario identification adopts a two-tier approach, with classes on the first tier and variants on the second. The first tier includes (a) Conventional Worlds, (b) Barbarization and (c) Great Transitions. Under the Conventional Worlds scenario, global systems are expected to evolve with no major surprises or discontinuities, and the future is shaped by the continued evolution, expansion and globalization of the dominant values. On the other hand, the Barbarization and Great Transition scenarios involve the profound transformation of society, the former resulting in a total collapse of many of the existing arrangements, and the latter bringing about significant qualitative improvements.

The SEI approach defines two variants for each of the above first-tier scenarios. In the case of Conventional Worlds, these are (a) the Reference variant and (b) the Policy Reform scenario. In the case of Barbarization, the variants are (a) the Fortress World and (b) Breakdown. And for the Great Transition, the variants are (a) the New Sustainability Paradigm and (b) Ecocommunalism. Gallopin *et al.* give a detailed description of each of these scenarios and variants, and their effects on key aspects such as population, economy, environment, equity, technology and conflicts.

especially in responding to rapidly changing economic conditions, has lent support to drastic institutional changes emphasizing the role of *market forces* in deciding resource use patterns. The basic premise is that market mechanisms provide appropriate signals to all economic actors, resulting in more efficient and rational resource allocation. In fact, most countries are making an effort to pursue the market-oriented approach, with privatization of forests and forest industries as a major component of economic reforms.

In most countries neither the public sector nor market forces encompasses all economic activities. This is particularly the situation in Africa, where a large number of actors operate in the *informal sector*, which is often much larger than the formal sector. Hence the need to consider its development as a distinct scenario. However, there are limits to the ability of the informal sector to grow and provide all the necessary goods and services. At least in certain situations, resource use conflicts lead to the development of a *fortress scenario* that is largely geared to safeguarding the interests of a few who have benefited from the current inequitable distribution of wealth and income.

In the long run, the fortress scenario is also unstable, since it could degenerate into a state of barbarization – a complete breakdown of the State and related arrangements when control passes to warring groups[18]. Although this could last for a long time, societies have the potential to pursue a path of reconciliation and to move to a scenario of the *Great Transition* in order to develop and accomplish a much larger vision. There are already some indications that this scenario is taking hold in Africa. Discussions of an African renaissance, with the development of democratic institutions, the decentralization of resource management responsibilities and the encouragement of community participation, could be considered as efforts to accomplish the Great Transition. The formulation of NEPAD and the establishment of the African Union are indicative of the interest in pursuing a path of development leading to the Great Transition.

Two aspects in particular need to be emphasized in the discussion of scenarios:

- scenarios indicate a wide range of possibilities; they are not dead ends, but evolve continuously over time, depending on the nature of interventions, or the lack thereof;
- elements of different scenarios can coexist; for example, market forces may dominate in commercial plantations, while the public sector controls natural forest management and the informal sector drives non-wood forest product collection and processing; over time, the effect of the scenarios on various activities may change.

Public sector dominance

Most early concepts of development envisioned strong public sector intervention in all spheres of economic activity, including agriculture, industrial development and utilities, as well as forestry. Absence of a viable private sector encouraged such an option. Several countries pursued efforts to improve the production of cash crops (especially coffee, cocoa, cotton, etc.), which significantly contributed to forest clearing. Forestry was another area for early public intervention. In several African countries, forestry departments were established almost a century ago to exploit and manage forest resources to meet the demand for wood, especially in external markets, and to help build such infrastructures as railways. Public sector involvement focused on forest reservation and timber extraction from easily accessible areas. This trend has continued to the present day. Key characteristics of this scenario can be summarized as follows:

- the government is the main actor, and other actors are subject to rules and regulations formulated by the government. In general, the government excludes other actors or permits them to function only insofar as their actions do not undermine the objectives of the government;
- in most cases, the public sector dominates all commercial and non-commercial functions, often regulating markets through administered prices and controlling product supplies. Government involvement in forestry includes management of natural forests and woodlands, harvesting, transportation, processing, plantation establishment and management, forest industry management and all other allied activities such as training, education and research;
- governments also assume responsibility for fulfilling social and environmental functions, including the organization of woodfuel supplies, the generation of rural employment through forestry activities, and the establishment and management of protected areas.

[18] Barbarization is a distinct possibility in certain situations, as is evident from the experience of Somalia, where the State has become completely dysfunctional. This situation also exists in certain parts of many other countries.

However, in recent years the role of the public sector has been on the decline, either by design or default. The public sector has not been able to meet the diverse needs of a wide variety of stakeholders with often conflicting demands. Other actors are now emerging as providers of goods that were once the domain of the public sector.

In the above context two alternative paths can be envisaged for the development of the public sector during the next two decades, as indicated below.

Declining capacity of the public sector

This situation is emerging in several countries, largely as a result of the following factors:

- budgetary resources are diminishing, especially as governments continue to implement structural adjustment programmes and transfer the few profit-making ventures to the private sector;
- insufficient investment in human resources within the public sector is causing a lack of motivation and leading to the loss of technically competent people;
- even when the overall budgetary situation improves, many governments will be unable to invest in improving the capacity and competence of forestry agencies in view of other priorities, especially health care and education. This will be particularly the case with some of the countries in the region that are severely affected by HIV/AIDS.

In the foreseeable future, the public sector is unlikely to be able to fulfil its traditional role. In most respects it will not be able to function as an impartial arbitrator and act in the larger public interest. Ruptures could occur on account of the following factors:

- the ability of the public sector to provide goods and services and to enable other actors to operate efficiently by providing an effective regulatory framework is declining;
- in most cases the market mechanism, which could fill some of the vacuum left by the public sector, is unable to provide certain goods and services, especially those that are not profitable. This may result in the informal sector filling the void. Most often privatization has been limited to profitable public enterprises, while there are no takers for loss-making government firms;
- the knowledge base is rapidly declining, thus undermining the ability of the public sector to function effectively because of the lack of investment in human resources, including education and training;
- declining public sector investment has undermined the growth of scientific and technological capacity in most countries. In particular, the research capacity of Africa's forest sector has declined. Dependence on imported technology is therefore on the increase. Barriers to access new technology and its adoption are accentuating the already wide technology gap.

A revitalized public sector forestry organization

The alternative to declining public sector efficiency involves its restructuring, and efforts in this direction are under way in several countries (for example Mozambique, Uganda and Zimbabwe) by redefining the functions and responsibilities of the public sector and providing adequate financial support. While divesting it of responsibility for production, processing and trade, emphasis is being given to the following responsibilities:

- policy formulation;
- enforcement of compliance with policies and related regulations;
- monitoring of performance;
- facilitation of the involvement of other key stakeholders in forestry;
- fulfilment of the social and environmental needs of the people, especially when other institutional arrangements are inadequate.

Future developments will, however, depend on how these efforts are sustained. In most cases public sector reforms have been initiated with donor support, often without a clear perception of how the reform process is to be pursued, especially in the context of resistance to change. The following are some of the problems encountered in ongoing public sector reforms:

- such reforms are largely taken up as part of the drive

BOX 18

MOZAMBIQUE: CHANGING ROLE OF THE PUBLIC SECTOR

The role of the forestry and wildlife administration is expected to change in forthcoming years. Wildlife conservation areas have recently been transferred to the Ministry of Tourism, with the aim of boosting tourism in those areas. The forest sector will be more oriented to providing services to the private sector and supporting the local community, as well as achieving a better partnership with the private sector. The devolution of ownership of natural resources to the local community will improve management of these resources.

(Cruz, 2000)

to reduce public expenditure, and there is often no long-term commitment to undertaking meaningful reforms; sustainability of the reform process is a major concern, especially since many of the initiatives are donor-orchestrated;
- investment in research, education and training is low;
- the focus is on bringing about reactive policy responses and some institutional changes that are unlikely to be accompanied by sustained capacity-improvement measures.

Of the two broad paths of development possible for the public sector, it would seem that in most countries the general trend indicates a decline in capacity.

Market forces

The structural adjustment programmes implemented in most countries have supported a pre-eminent role for market forces, making the private sector a major provider of goods and services. This assumes that market mechanisms will be able to provide goods and services more efficiently and economically. Efforts to promote the private sector are bringing about fundamental changes in agriculture, energy, industry and services, and these changes have direct and indirect effects on forests and forestry. The extent of private sector involvement in forestry in Africa varies considerably. In some cases its presence is already very strong, especially in logging, forest plantation management, wood processing and trade. It may also become a major player even in the provision of global public goods through carbon-sequestering plantations, depending on their economic viability. However, in several countries an effective indigenous private sector with the necessary capacity to invest in forestry is absent. Key areas of involvement of the private sector can be summarized as follows:

- the private sector already dominates logging operations in most African countries. In many countries it has become the major player, even in forest plantation management. Smallholders have also invested significantly in establishing farm woodlots and home gardens. In several countries, forest plantations and industries managed by the public sector have been transferred to the private sector. South Africa is one country where the private sector has been playing an active role in forest plantation management (see Box 19) and there are ongoing efforts to privatize some government plantations. In some cases, management responsibility is assigned to independently functioning parastatal organizations, which is often an intermediate stage before fully-fledged privatization;
- wildlife-based tourism is another area where private sector involvement has increased considerably, largely as a result of the anticipated continued growth of the tourism industry. Management of some profitable national parks and game reserves is another candidate for private sector involvement. Private parks catering to niche markets already exist in East and Southern Africa, especially in Kenya, South Africa and Zimbabwe;
- in most countries, many services, including energy and water, are being privatized, resulting in the elimination of consumer subsidies. Efforts to protect the sources of supply, including the establishment of water catchments and systems of resource transfer that reflect the role of forests in protecting watersheds, will increase. Such efforts could be of particular relevance to countries and people who are saddled with the responsibility of protecting watersheds for the benefit of those living downstream;
- at the global level, the emergence of carbon credit trading is another development that would expand the role of market forces in providing global public goods.

Market forces are also determining the nature of technological changes, including the development and adoption of new technology. The private sector has thus been in the forefront in adopting new technology, especially if it confers competitive advantages. Private sector research and development efforts have increased, particularly in areas such as tree improvement, plantation management, harvesting, transportation and wood processing. Considering the

BOX 19

PRIVATE SECTOR INVOLVEMENT IN SOUTH AFRICAN FORESTRY

The industry is strongly influenced by the two major private players, South African Pulp and Paper Industries Ltd and Mondi Paper Ltd. Both have major pulp and paper operations and are vertically integrated. The majority of South Africa's plantations (about 70 percent) are privately owned, the largest category being industrial owners. These owners have a high degree of self-sufficiency in fibre supply, obtaining most of their raw material requirements from company owned or managed plantations.

(Madula and Simelane, 2001)

declining role of the public sector, wider adoption of known technology will depend largely on private sector initiatives.

As in the case of development paths indicated for the public sector scenario, the market forces scenario could also unfold in different directions. It is, however, difficult to identify the precise events and paths of development during the next two decades. The direction in which the market forces scenario will unfold depends on:

- the existence of a framework necessary for the efficient functioning of the private sector;
- the capacity of the private sector to take advantage of emerging opportunities;
- the commercial viability of the various activities;
- the size of the market and the willingness and ability of consumers to pay for the goods and services;
- the ability to compete in the global marketplace.

Some of the problems relating the development of market forces in African forestry can be summarized as follows:

- in the absence of perfect competition, the process of privatization could be defective, resulting in the transfer of public resources to private monopolies without necessarily improving efficiency. The market mechanism may not be able to avoid the effects of shortcomings in the prevailing political and institutional environment;
- private sector performance is crucially dependent on the demand for products and services, and thus on consumers' willingness and ability to pay. Low incomes in Africa keep demand low, necessitating dependence on external markets, whether for wood and other forest products or services such as ecotourism[19]. Dependence on external markets would, however, introduce new problems, especially because of uncertainties arising from the changing global demand and supply situation;
- in the African context, where the indigenous private sector is less developed, privatization would expand the role of multinational corporations. Foreign companies already play a key role in several forestry activities, including logging (see Box 20), wood processing, trade, plantation establishment and ecotourism. Globalization

[19] Low demand is one of the reasons for the low rate of intraregional trade in Africa. Moreover, although production of high-value-added products is still low, African countries are exporting a large proportion of their output, mainly because of the lack of domestic demand.

BOX 20

PRIVATE SECTOR INVOLVEMENT IN THE LOGGING INDUSTRY IN HUMID TROPICAL AFRICA

The private forestry sector in humid tropical Africa is made up of the following parties:

- the large European Groups, with a global turnover of US$ 100 to 500 million per year. These companies are often established in several African countries with business offices and factories and pursue a long-term strategy;
- asian groups, generally of Malaysian and Chinese origin. These groups have been established in Africa since the mid-1990s. Some amongst them have closed down due to the recent Asian crisis, although others have arrived;
- medium-sized businesses, whether they be African national, European or Lebanese in ownership. These businesses often lack technology and financial means. They generally have very short or medium term strategies;
- small national businesses. These are often family or village businesses, generally informal. The small size of their forest concessions, their lack of technology and financial means does not allow them to pursue any strategy other than from day to day. In Cameroon there are now over 800 of these small national concerns and in Gabon more than 150;
- in many African countries such as Côte d'Ivoire, Cameroon, Gabon and Congo many joint ventures are built up by Africans with political connections but using European or Lebanese workforce/expertise. Here the object is to generate a maximum amount of money in the shortest possible time. It is therefore obvious that SFM and legal pre-occupation are far from the objectives of these businesses.

Despite this wide range of parties involved in forestry in humid tropical Africa, it has been estimated that more than 50 percent of the forestry harvesting and processing enterprises in certain countries belong to large foreign groups of which the most important are: the Dutch Group Wijma; the Italian groups Mussi Bianci and FIP Bruno; the German groups Danzer, Wonneman and Fedmeyer and the French Groups Rougiér, Sevant, Thanry and Interwood.

These and other private sector firms cover some 20 million ha of forest and are traditionally selective in their harvesting techniques, logging vast areas for a few fashionable species at low intensity.

(Landrot and Speed, 2001)

would further strengthen this process. The divergence between national and corporate interests and objectives could create conflicts;
- increasing inequalities in income and wealth, which are already acute in Africa, would be a key factor of rupture in the development of market forces.

Given the weak institutional arrangements and inequities, market forces may not be able to address the acute economic and social problems in Africa. Changes in regional and global markets will have an impact on further development of the private sector in African forestry. Low consumption of value-added products in Africa suggests potential internal markets. However, in the absence of effective internal demand, arising from low incomes and purchasing power, it is imperative for Africa to export value-added products. The main factors hindering exports are:
- low investment in processing because of the high perceived risk and uncertainty;
- dependence on imported technology as a result of inadequate investment in science and technology within the region; and
- increasing competition in the global marketplace.

In short, there are significant limitations to the full development of market forces in the African context during the next two decades. Initially, market forces may empower a small number of entrepreneurs, but social tensions may increase as a substantial number of the actors becomes marginalized and disempowered[20]. Unless there are concerted efforts to address deficiencies, especially by providing a level playing field and a transparent framework, the ability of market forces to provide a more desirable path of development will be severely challenged.

BOX 21

NECESSARY CONDITIONS FOR PRIVATE SECTOR GROWTH

The legal framework for commercial infrastructure must be clear, transparent and enforceable. It should aim at protecting property rights and promoting investor confidence and thus willingness to be involved. Individual property rights would need to be defined clearly, and the laws enforcing them would need to be defined fair and equally clear. The individual consumer has as much right to receive what he or she bargains for in the same way as the enterprise has the right to recover its costs in providing the service including a fair return to the investment. Thus, laws protecting such relationships must be fully enforceable by a credible legal system that is beyond reproach.

(African Development Bank, 1999)

Informal sector

In most countries, neither the public sector nor market forces encompass the entire range of forest sector activities, a significant proportion of which is in the less organized informal sector. The informal sector in fact provides a substantial proportion of goods and services and is the foremost source of employment and income. Activities such as wood collection, charcoal production, pitsawing, the collection and marketing of non-wood forest products, and small-scale furniture production form the mainstay of the livelihoods of many people[21]. A key feature of the informal sector is that few of those involved in informal sector activities own the resources. Three broad types of informal activity can be distinguished in African forestry:
- *low-value unorganized activities largely geared to local subsistence consumption.* For example, the collection and use of woodfuel, non-wood forest products and poles are critically important to the livelihoods of those who operate outside the context of market forces;
- *informal sector activities linked to markets.* The production and marketing of charcoal and the collection and marketing of non-wood forest products, especially medicinal plants, which are often exported, span purely informal activities and highly organized trading. Most of the products are collected from public land. The collectors seldom own the resources and there is hence no interest in investing in their management, resulting in depletion as harvesting intensity increases in response to growing demand. As most of those employed in resource exploitation operate in the informal sector, they receive only a small share of the market value of the products, with a significant proportion accruing to intermediaries;
- *high-value informal activities, often managed by well-organized illegal networks, such as the illegal*

[20] This is particularly so when the best land is used for the production of export crops, reducing the ability of others to produce goods and services that are critical to their livelihood.

[21] A recent study by the International Labour Organisation "guesstimates" that the invisible sector in forestry accounts for about 63 percent of worldwide employment in the sector. The forest-based informal sector accounts for 34 percent of employment (International Labour Organisation, 2001). Considering that the formal forest sector is far less developed in Africa, the proportion of employment contributed by the informal sector could be significant – and much more than the worldwide estimate provided by the International Labour Organisation.

extraction of tropical timber. This category is similar to the well-organized formal sector, except that it is illegal and focuses on private appropriation of public wealth. Such organized, large-scale illegal activities are particularly widespread in resource-rich Central and West Africa, largely because of the weaknesses of existing institutions.

The informal sector is expected to grow, especially if the formal sector fails to expand and absorb all the additional people joining the workforce, and meet their demands for goods and services. This is even more so since the aspirations of young people are changing and the prospects for cash crop production are declining. While the informal sector is a critical source of income, its expansion could result in a number of possible problems:

- resource depletion is a major problem for the growth of the forest-based informal sector. Most of those who operate in the informal sector do not own the resources and have no ability to exclude others and invest in their improvement;
- low levels of innovation and technology development are a major problem in the informal sector. The transient nature of informal sector activities and the limited capacity of those involved in them to adopt available technology increase the pace of resource degradation;
- as the informal sector expands, it may compete with the formal sector for resources, as is already happening in most countries. Plantations and natural forests owned by the government or private sector may suffer from charcoal production, pitsawing, woodfuel collection, illegal felling or other activities. Poaching of wild animals is a major problem in most of the national parks and game reserves. Where the resource is valuable, this situation may lead to preventive action by the owners and the emergence of a fortress scenario.

Of the three types of informal activity, the organized informal ones, especially illegal logging and the trade in wildlife, could be curtailed to some extent by increasing capacities for governance. The growing involvement of organizations at the global level – Green Peace, Global Witness and Global Forest Watch Initiative, Environmental Investigation Agency, TRAFFIC, etc. – could significantly help to track the international network of illegal logging and facilitate preventive and corrective actions, although finding a long-lasting solution depends on substantial institutional improvements and wider changes in perceptions and attitudes. However, the importance of the other two types of informal activity is unlikely to diminish, especially in view of the limited impact of market mechanisms and the inability of the public sector to address deprivation and exclusion.

The fortress scenario

As already indicated, a fortress scenario may emerge as an outcome of increased conflict between the formal and informal sectors, especially in view of the latter's expansion. Increasingly, as in the case of other public and private property, national parks, watersheds, plantations and forests are suffering from encroachment, poaching and outright destruction. Tightening resource protection reduces the losses caused by these activities. The overall environment in several countries in Africa gives an indication of the increasing shift to a fortress scenario[22]. A weakened forestry organization and a slow and ineffective legal system are unable to deal with such incursions. Protecting critical areas often requires the creation of a tight security system around them. Some of the characteristic features of this scenario in the context of forestry are:

- identification of areas that are considered particularly critical for economic and environmental reasons – possibly including high-biodiversity areas, game reserves attracting large numbers of visitors, or plantations of high-value species;
- assignment of the task of protecting such areas to well-organized and well-equipped units.

The fortress approach concentrates efforts on areas of critical importance. Several national parks and forests have adopted such protective measures, including barbed-wire fences and armed security guards to deal with poachers[23]. In some countries national parks are managed by the ministry of the interior, emphasizing policing functions. Current trends indicate that the situation is likely to worsen and that the fortress scenario will become more widespread. Events could unfold in the following direction:

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[22] At the global level, many countries have virtually become fortresses to prevent immigration, especially from economically and politically unstable countries. In several countries social tensions have resulted in high crime rates so that people who can afford to do so live in high-security areas. Although economic growth has stagnated and declined in many countries, private security services are growing rapidly.

[23] A typical example of this is the transfer of the management of the Mount Kenya Forest Reserve from the Forest Department to the better-staffed and better-equipped Kenya Wildlife Service.

- those involved in illegal activities become increasingly organized and equipped, in which case it becomes imperative to keep stepping up protective measures. The degree of effort made will be directly proportional to the value assigned to the resource;
- beyond a certain point, additional protection becomes uneconomical;
- as the cost of protection rises, the competitive advantage of countries diminishes. All those investing in resource management face the prospect of reduced profitability, and in many cases this has already prompted industrial units to move to more secure locations[24].

When the fortress cannot be protected, there is a complete breakdown of law and order, often leading to a barbarization scenario. If the fortress situation is to be reversed or avoided, the fundamental problems of unbalanced/inequitable development must be addressed and the public sector and market institutions must be strengthened to facilitate more inclusive development.

The Great Transition

The four scenarios already described depict the range of situations confronted now and what is likely to happen if some of the current trends persist. In most countries a combination of public sector dominance, market forces dominance and informal sector dominance scenarios exists. In several instances there are clear signs of a deterioration to a fortress scenario and in some cases even the emergence of a barbarization situation. However, there is considerable awareness of the need for change to a more desirable situation. As democratic systems take hold, there is increasing discussion of an African renaissance. This quest for the Great Transition is reflected in various initiatives, such as the Millennium Partnership for African Recovery Programme (MAP), and the OMEGA plan. One of the most important recent initiatives is NEPAD (see Box 22). All these initiatives give considerable emphasis to sustainable development and identify peace, democracy, human rights, sound economic management, and regional integration and cooperation as the key elements and preconditions for change.

The Great Transition builds on the positive aspects of the public sector, market forces and informal sector scenarios and helps to empower all the actors by providing a common vision. Appropriate reforms to address the shortcomings of the public sector and market forces, and to support the large informal sector that is critical to the provision of goods and services for marginalized people, are the key to accomplishing this change.

Access to resources by rural communities is addressed through increased emphasis on community participation in resource management. As indicated earlier, there are several ongoing efforts in this direction, and the concept of community participation in forest resource management has found wider acceptance than was the case a decade ago. It is, however, important to pursue the efforts and to address the various problems that arise as the process follows its course.

Non-governmental organizations and international initiatives have played a key role in bringing about policy changes that are the precursors of the Great Transition. Increasing concern about poverty and deprivation has resulted in national and international initiatives focusing on a range of issues, including governance, transparency, public participation and democratic institutional arrangements. International donor agencies are redirecting their technical and financial support to alleviating poverty and improving the livelihoods of people marginalized by existing arrangements. Global initiatives in the fields of biodiversity protection, desertification control and climate change prevention have led to supportive country-level actions, although the degree of effort varies considerably from country to country.

NEPAD has identified a number of sectoral priorities and some of the issues involved in implementation, including the mobilization of resources. However, it will take some time for the partnership to become fully operational and for the Great Transition to unfold. The following are some of the likely outcomes of such a transition:

- widespread empowerment of people unleashes their latent capacities and initiatives. This empowerment is not dictated entirely by market forces. No one is socially, economically or politically marginalized;
- democratically functioning governments and other institutions play a dominant role, especially in laying down a strong framework within which various actors can operate, developing institutional

[24] There are already instances of industrial units moving to other countries in view of increased protection costs. With trade barriers coming down (for example COMESA's adoption of zero tariffs) companies can change their location in response to a worsening security situation without undermining market access.

BOX 22

THE NEW PARTNERSHIP FOR AFRICA'S DEVELOPMENT

The New Partnership for Africa's Development centres around African ownership and management. Through this programme, African leaders are setting an agenda for the renewal of the continent. The agenda is based on national and regional priorities and development plans that must be prepared through participative processes involving the people. We believe that while our African leaders derive their mandate from these plans, it is their role to articulate them as well as lead the processes of implementation on behalf of the people.

The programme is a new framework of interaction with the rest of the world, including the industrialized countries and multilateral organizations. It is based on the agenda set by the African peoples through their own initiatives and their own volition to shape their own destiny.

To achieve these objectives, African leaders will take joint responsibility for the following:

- strengthening mechanisms for conflict prevention, management and resolution at the regional and continental levels and to ensure that these mechanisms are used to restore and maintain peace;
- promoting and protecting democracy and human rights in their respective countries and regions, by developing clear standards of accountability, transparency and participatory government at the national and subnational levels;
- restoring and maintaining macro-economic stability, especially by developing appropriate standards and targets for fiscal and monetary policies and introducing appropriate institutional frameworks to achieve these standards;
- instituting transparent legal and regulatory frameworks for financial markets and auditing of private companies and the public sector;
- revitalizing and extending the provision of education, technical training and health services with high priority given to tackling HIV/AIDS, malaria and other communicable diseases;
- promoting the role of women in social and economic development by reinforcing their capacity in the domains of education and training; by the development of revenue-generating activities through facilitating access to credit; and by assuring their participation in the political and economic life of African countries;
- building the capacity of the states in Africa to set and enforce the legal framework as well as maintain law and order;
- promoting the development of infrastructure, agriculture and its diversification into agroindustries and manufacturing to serve both domestic and export markets.

(Economic Commission for Africa, 2001a)

arrangements for conflict resolution and ensuring that just decisions are effectively implemented;

- conservation and scientific management of natural resources, including forests, become an integral part of the development objective, balancing economic, social, cultural, environmental and spiritual dimensions.

The Great Transition scenario is socially, economically and environmentally sound. However, precisely for this reason, its emergence may take a long time. Some of the problems that may undermine progress towards the Great Transition include the following:

- in most cases, the capacity of governments and other actors to implement necessary policy changes is far from satisfactory. In an ideal world, once commercial functions are transferred from the public to the private sector, the public sector can focus on providing a policy framework and fulfilling its regulatory functions. For a variety of reasons, including the lack of necessary technical skills for policy analysis, monitoring and review, the capacity of the public sector to provide policy guidance remains weak;
- policy changes to support participatory approaches have been hailed as a major paradigm shift. However, although these efforts have been under way for nearly 20 years, the extent of the participation of rural communities is still very limited. In general, community participation has been easily accepted and adopted in the case of low-value forests, while local communities are largely excluded from managing and sharing resources that are potentially more valuable. Such initiatives are often based on donor support with a poor track record of sustainability;
- corrective policy measures, especially addressing social and environmental concerns, may conflict with existing power structures, including the neo-liberal policies advocated to promote international investment. A typical example of this is land reforms.

Actual progress in accomplishing the Great Transition will thus depend on a variety of factors, particularly on

whether a collective vision is developed and pursued, thus helping to resolve many of the existing conflicts, and on whether appropriate institutional mechanisms are put in place. The next two decades may see considerable progress towards the Great Transition, although this may still fall far short of accomplishing the larger vision of an African renaissance.

SCENARIOS: THE REAL WORLD SITUATION

The five scenarios described above represent a range of possible futures for Africa and the forest sector. They also show that one scenario can lead to another, depending on how society adapts to changes and how corrective action is taken to avoid negative tendencies. In a highly diverse country or region, all the five scenarios could coexist, their relative importance changing over time in response to changing conditions. For example, the market scenario may be more important for small segments of the economy geared to meeting global demand for certain products, such as pulpwood, while the informal sector may dominate segments catering to local demand, such as woodfuel. There may also be a segment of the more organized informal sector catering to global demand through illegal harvesting and marketing of forest products. Some efforts are under way to facilitate the shift to the Great Transition by decentralizing resource management and improving participation and governance. The overall situation that could emerge in Africa can be depicted in the diagram below.

The situation in most countries can be depicted as a combination of the three core scenarios, namely public sector dominance, market forces dominance and informal sector dominance (see Figure 6). Each of these segments has its strengths and weaknesses. In a business-as-usual situation, this combination could persist, largely maintaining the present situation, with some shifts in the relative importance of the three core elements. However, if the negative tendencies in each of the three scenarios become stronger, the situation is likely to deteriorate, resulting in the emergence of a fortress scenario or even a decline to barbarization. On the other hand, if concerted efforts are made to address the weaknesses and enhance the positive aspects of the three scenarios, there is an excellent opportunity to move towards the Great Transition.

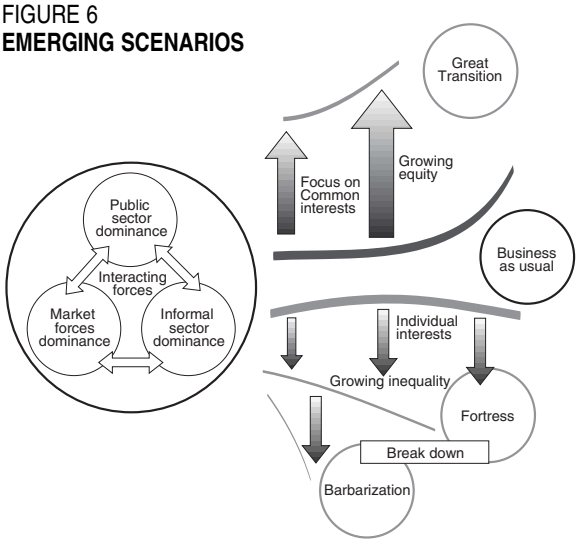
The next chapter discusses what is likely to happen if the business-as-usual situation prevails in the context of the driving forces and the three core scenarios as they exist today.

BOX 23

LIKELY FUTURE SCENARIOS

- Market forces will grow in importance, largely taking advantage of emerging opportunities for the trade in forest products. Logging of natural forests will continue in the next two decades. Plantation-based industrial development will remain confined to those areas where it is already well established.
- The role of government in producing wood will decline as this function is increasingly taken over by market forces and the informal sector. The public sector's role will be limited to policy-making, regulatory functions and the provision of goods and services that the private sector is unlikely to provide.
- The informal sector will continue to dominate forestry activities, producing most fuelwood and non-wood forest products. Although the role of the organized informal sector may persist in some countries, it is in general likely to decline owing to growing awareness of illegal logging and the initiatives of various organizations to improve transparency.
- Efforts to realize the Great Transition are already under way, as evidenced by increasing emphasis on democratic decision-making, transparency and participation. While these efforts will cause a significant paradigm shift, the rate at which they will take place is uncertain. They may not be completed within the time horizon of FOSA.

FIGURE 6
EMERGING SCENARIOS



Chapter 5

Consequences for forest goods and services

Given the impact of the various actors in the context of the driving forces and the alternative scenarios, it is important to consider the future state of forest resources and the flow of goods and services. How forestry in Africa is likely to evolve could be examined on the basis of a number of issues or questions. Some of the most important of these are:

- the forest cover and the rate of its change;
- implementation of sustainable forest management;
- shifts in the source of wood supplies, especially towards intensively managed plantations and trees outside forests;
- the demand for and supply of woodfuel;
- the demand for and supply of industrial wood and wood products;
- Africa's role in the trade in forest products;
- the potential for non-wood forest products to become a major source of income and employment;
- the future of wildlife management;
- improvement in the provision of environmental services by stabilizing watersheds and arresting desertification and land degradation;
- the contribution of African forests to providing global public goods such as climate change mitigation;
- the role of forests and forestry in poverty alleviation.

This list is not exhaustive and new issues could be added, as they become important. Below is a brief analysis of the issues identified in the context of the driving forces and scenarios discussed in the earlier chapters.

FOREST COVER AND ITS CONDITION

As mentioned earlier, Africa lost 53 million ha of its forests between 1990 and 2000, accounting for about 56 percent of the global forest cover loss. Although most countries do experience some deforestation in the early stages of economic development, at some stage it stabilizes and recovery begins. This takes place when the dependence on forests to provide material goods diminishes and their environmental and aesthetic values become more important. The key question is whether this trend will develop in Africa in the next two decades or whether the current rate of deforestation will continue.

A number of direct and indirect factors affect the area and condition of forests, and these need to be considered in the context of the various scenarios, reflecting the role of the various actors. The main scenarios in Africa are: public sector dominance, market forces dominance and informal sector dominance. In some countries, pockets of a fortress situation and barbarization are also found, as well as some beginnings of the Great Transition with stress being laid on strengthening participatory efforts and decentralizing resource management. Within this context, forest-cover change will be determined largely by population growth and overall economic development, especially developments in the agricultural sector. The following factors need to be taken into account:

- the population will continue to grow, resulting in an additional 388 million by the year 2020, thus increasing the total to 1 186 million;
- as in the 1990s, most countries will continue on a low economic growth trajectory. All the indications are that if the present trend continues, the average annual GDP growth is unlikely to exceed 4.0 percent per year during the next two decades. Once the population growth rate is accounted, the per capita income growth is likely to be about 1.5 percent requiring about 50 years for the income to double. The result of this situation will be an inability to invest in forest conservation and management, and the continued dependence of a large number of people on forest resources;
- growth in other sectors will continue to be sluggish, perpetuating dependence on land;
- the inability to invest in productivity-enhancing technology will persist;
- a key factor in forest-cover reduction will be the expansion of agriculture. Demand for cereals is expected to grow from about 86 million tonnes in 1997 to 1999 to 139 million tonnes in 2015 and 208 million tonnes in 2030, resulting in an increase in arable land from 228 million ha in 1997 to 1999 to 262 million ha in 2015 and 288 million ha in 2030 (see FAO, 2002b). Most of the increase in area will take place in the rainfed segment, and the increase

in productivity through intensification, especially through irrigation, will be limited. The expansion of irrigated land is expected to be very modest, largely because of the limited capacity of the public sector to invest in irrigation projects.

Much of the large-scale expansion of agriculture in the past has been supported by the public sector. A decline in the latter and the increasing reliance on private sector initiatives are expected to bring about substantial changes in the pattern of agricultural expansion. Trade liberalization and consequent changes in imports/exports are also expected to affect the pattern of agriculture and therefore forests. At the same time there may also be an expansion of subsistence agriculture, especially by those with limited access to markets. Forest-cover changes will thus largely depend on specific developments in some of the key subregions and countries.

Within each subregion, most forest-cover loss is accounted for by a few countries. For example, in North Africa, the Sudan accounted for nearly 1 million ha of deforestation per year (FAO, 2001a). In the relatively high-income countries of North Africa, the rate of deforestation is low. In Southern Africa, Zambia and Zimbabwe accounted for most of the deforestation, while in Central Africa it is largely attributable to the Democratic Republic of the Congo, and in West Africa to Nigeria. Income growth and diversification based on the development of other economic sectors, as is happening in Gabon, are key factors in reducing deforestation rates. However, such reduction also depends on the pattern of development. An enclavist development, largely benefiting a small segment of the population, may not help to reduce forest-cover decline.

All the indications are that deforestation in Africa will continue as a result of agricultural expansion, forest conversion for mining and other activities, and wood production, including woodfuel to meet the growing urban demand. However, the situation may ease in some countries that currently have high rates of deforestation. For example, deforestation may decline in Angola and the Sudan, which are emerging as major oil producers, reducing their dependence on forests. Likely changes in the various subregions are indicated below:

- in the case of the North Africa subregion all the deforestation is accounted for by the Sudan. However, recent economic changes, including the production and export of petroleum, liberalization of the economy and dismantling of public sector support for the expansion of rainfed cultivation all indicate the likelihood of a decline in the rate of forest clearing. Current efforts toward fuel switching through increased availability of LPG are expected to reduce the pressure on forests to meet urban woodfuel demand. All these elements would suggest some substantial slowing down of forest-cover reduction in the Sudan and consequently in the North Africa subregion;
- although the East African countries have a low rate of deforestation in comparison with other subregions, the situation there is unlikely to improve – and is in fact likely to worsen in the next two decades. A high population density coupled with a high dependence on land indicates increasing land use conflicts in most countries. Furthermore, most East African countries are economically poor, with very limited opportunities for diversification. In the unlikely situation of major structural changes in the economies, the rate of deforestation is unlikely to decline;
- Southern Africa witnessed the highest rate of deforestation in the whole of Africa in the 1990s, much of it in Zambia and Zimbabwe. All the indications are that deforestation will remain high, on account of low economic growth rates and continued dependence on land. Ongoing land reforms in some of the countries could further accentuate the problem in the immediate future, although in the long term it may have a stabilizing effect, provided the beneficiaries of land reform adopt improved land management practices. There could also be an increase in deforestation in countries such as Angola and Mozambique as they expand the area under agriculture, both commercial and subsistence;
- in Central Africa most of the forest-cover reduction has taken place in the Democratic Republic of the Congo and Cameroon. Although the recent decline in cash-crop prices would indicate less forest clearing for cultivation, the long-term prospects for such crops and the emergence of new ones have to be taken into account. In view of their low population densities and their relatively large expanses of land, some Central African countries could witness an expansion of cultivation, depending on the development of their transport infrastructures. As logging expands and accessibility improves, there will be strong incentives for forest clearing for commercial and subsistence cultivation. Another factor that may accelerate forest-cover loss is the logging of easily accessible secondary forests, especially as the marketability of species improves as a result of technological advances;

- considering the high population and the continued dependence on land, land use conflicts are expected to intensify in West Africa, affecting forest cover. The rapidly growing urban population will exert an increasing demand on forests, especially for wood fuel and construction timber. Forests and woodland in both the humid and dry zones will decline at more or less the same rate as in the 1990s.

Differences in the driving forces operating in the various countries and the complex cross-sectoral linkages make it hard to give a precise indication of future changes in forest cover. Any substantial reduction in the overall deforestation rate will depend on what is happening in some of the key countries. Major shifts have been observed, as in the case of the Sudan, indicating some decline in deforestation, although this may be vitiated by increased clearance in some countries, especially in Southern and Central Africa.

SUSTAINABLE MANAGEMENT OF FORESTS AND WOODLANDS

An increase in the area of forests and woodlands will be one of the major indicators of improvement in the forestry situation in Africa. To make a meaningful assessment of progress on this front, it is important to know the area currently under sustainable management, as well as the impact of ongoing efforts to implement sustainable forest management and how these are likely to develop in the context of the driving forces and scenarios. However, the lack of sufficient data on these elements makes it hard to give an indication of what is likely to happen in the next two decades.

Unless significant efforts are made, the weakening of the public sector now evident is likely to persist, and the role of the informal sector is expected to increase correspondingly in most forested countries in the region. Although the private sector has been active in logging natural forests for a long time, in the absence of an effective policy, legal and institutional framework, efforts to implement sustainable forest management are unlikely to expand. This situation is expected to prevail in many countries in Central and West Africa, where the more organized informal sector has expanded logging, and the capacity of the public sector to implement sustainable forest management remains weak.

Some progress could, however, be envisaged in the sustainable management of savannah woodlands, especially in the context of increasing efforts to involve local communities. But the low returns from sustainable forest management may hinder progress in its wider adoption. Most of these woodlands are under community control and there are several instances of successful community initiatives. The potential for further expansion of sustainable forest management of communal land exists, but its success will depend on sustained efforts to improve the capacity of local institutions to resolve conflicts and pursue long-term collective interests.

SHIFTS IN SOURCES OF WOOD SUPPLIES

During the past two decades, there has been some shift in the sources of wood supplies from natural forests to plantations and trees outside forests. In many parts of the world, including some countries in Africa, plantations have become a major source of industrial wood supplies. This has to some extent helped to reduce the pressure on natural forests, enhancing the scope for using them largely to provide other goods and services. Whether such a shift is likely to accelerate in Africa during the next two decades depends on a number of factors, largely related to incentives or compulsions to rely on plantations and other planted trees outside forests.

Forest plantations

In worldwide terms, forest plantations form a major source of industrial wood, accounting for about 22 percent of annual industrial roundwood production (Brown, 2000). Based on estimates of area and productivity, it is estimated that the share of plantations will increase to about one-third of the global industrial wood demand by 2015 (Brown, 2000). Whether such a shift will be applicable to Africa during the next two decades depends on a number of factors:

- the total area of plantations in Africa in 2000 and the annual planting rate are estimated at about 8 million ha and 194 000 ha respectively. The latter figure includes some replacement planting, and no more than 50 percent of the plantations could be considered industrial. Most productive industrial plantations are in South Africa, Swaziland and Zimbabwe, and to a lesser extent Côte d'Ivoire, Ghana and Nigeria. Improvements in plantation management, including their productivity, will be largely determined by market forces. In a situation where public sector management is not responsive to market forces or where a number of factors inhibit industrial investment, industrial plantation development is unlikely to succeed. With the

BOX 24

IMPACT OF PLANTATIONS ON GLOBAL WOOD SUPPLIES

The plantation effect will very soon start to push the world's industrial wood supply and demand balance towards, if not into, surplus. This is the very reverse of the anticipated deficits (implied more often than stated) that have underlain forest policies almost everywhere, and it is a near certainty: even the somewhat restrained analyses of FAO show large leaps in industrial roundwood availability by 2010 at the latest. This turnaround to oversupplied wood markets will bring low and perhaps falling price ceilings and cut-throat competition, which will be particularly intense among wood products, while the costs of most of the inputs used in the forest products industries will continue to rise. There are no signs that the thought of the plantation effect bringing this sort of future is of concern to more than a few in the forest sector. Yet, that future is not much more than ten or 15 years away.

(Leslie, 2001)

anticipated spurt in wood supply from plantations from other regions (see Box 24), African plantations – except those from countries that are already well integrated into global markets – may not be able to compete in the global marketplace;

- the other major objectives of forest plantation establishment are woodfuel production and environmental protection. Most such planting is undertaken by the public sector. Considering the declining capacity of the public sector, this segment is unlikely to expand significantly. Even if there is some expansion in area, there is unlikely to be much investment in maintaining and improving productivity.

Although South Africa, with a well-developed industrial infrastructure, relies largely on plantations for industrial wood supplies, further expansion of plantations is hampered by the lack of available land and, more important, inadequate water supplies. Some potential to expand plantations exists in Mozambique, Tanzania and Zambia. Wood production in North Africa, and to some extent East Africa, will also rely on plantations, although constraints in terms of the availability of water and productive land will remain important factors in both subregions. Large-scale plantations may not have much promise in West and Central Africa, especially as long as natural forests meet most of the current demand for wood. Shortages in wood supplies, especially in West Africa, will be largely met through imports, especially from the wood-surplus Central Africa subregion.

Trees outside forests

A substantial proportion of roundwood supplies, especially woodfuel, is obtained from trees outside forests. This includes trees growing naturally on communal and private land, as well as those cultivated on farms under various agroforestry systems. Management of trees in woodlots and other farm plantings largely takes place in response to market demand, whereas the exploitation of tree resources on communal land and other free-access resources takes place largely in the informal sector. While overexploitation will deplete a substantial proportion of wood resources on communal land, some increase in trees outside forests is expected in a few countries where land and tree tenure are secure, and where tree growing is profitable in view of declining supplies from traditional sources.

This will particularly be the case in the densely populated countries of West, Central, East and Southern Africa. Trees grown on homesteads and woodlots (especially under outgrower schemes supported by industry) will become a major source of wood supply. All the indications are that there will be continued expansion of planted trees on farms and woodlots as farmers respond to increasing prices. On the other hand, as noted above, the decline of wood resources on communal land is likely to continue.

The change in supply sources is largely related to the nature of wood processing. Large industries requiring uniform raw material have no option but to establish plantations. The most remarkable change has been in South Africa, partially as a result of the political and economic situation during the apartheid period. In the absence of an integrated approach to forest plantations and industrial processing, there is unlikely to be a major shift towards obtaining wood from plantations.

WOODFUEL SITUATION

Wood is the foremost source of energy in Africa, primarily because of its low cost (especially when it is a free-access resource), making it accessible to low-income consumers, and its wider availability in comparison with other sources of energy. Depletion of resources in recent years has resulted in an increase in its direct and indirect costs. Likely changes in the consumption of woodfuel in Africa between 2000 and 2020 based on conventional forecasting methods, are summarized in Table 7.

Although there are problems in making more realistic forecasts, Table 7 gives an indication of the magnitude of increases. Wood consumption is expected to increase by

TABLE 7
Estimates of woodfuel consumption in Africa

Subregion	2000 (million m^3)	2010 (million m^3)	2020 (million m^3)
North Africa	60.08	67.29	72.22
East Africa	199.21	233.73	268.87
Southern Africa	84.32	99.05	115.79
Central Africa	116.42	137.16	157.83
West Africa	175.09	204.29	235.49
Total Africa	**635.12**	**741.52**	**850.19**

Source: Broadhead, *et al* 2001.

about 34 percent between 2000 and 2020. This is less than the population growth rate, to some extent reflecting the effect of other variables such as income changes and substitution. Major shifts in consumption will depend on ongoing efforts to improve the supply of woodfuel, and the potential for substitution, especially the availability of and access to commercial fuels.

In the next two decades, the informal sector will continue to play a dominant role in supplying woodfuel in most countries. The key players in production, trade and consumption will largely consist of those with limited resources. Most woodfuel will therefore come from unmanaged areas. This will affect long-term sustainability, and forest areas close to urban centres will be particularly affected.

The extent to which alternative energy sources replace woodfuel will largely depend on purchasing power and whether other commercial fuels are easily available. Several countries in Africa have substantial fossil fuel resources. Depending on investment in production and distribution, the scenario could change significantly[25]. Market forces and the public sector play major roles in the context of providing alternative fuels. In many countries, efforts to privatize commercial energy have increased costs, often resulting in reverse switching to woodfuel. This has been particularly the case in some urban areas, indirectly resulting in resource depletion.

However, some ongoing subregional initiatives have the potential to bring about a significant change in the energy supply situation. The West Africa Gas Pipeline linking Nigerian supplies with some of the ECOWAS countries is particularly relevant here (see Box 25).

In most other countries, where the scope for replacement by fossil fuel resources is limited, there are two broad types of possible intervention: the use of improved cooking devices to make the most efficient use of available woodfuel and biomass, and recourse to alternative energy sources such as biogas, wind and solar power. Experience with improved cooking devices, especially stoves, has been mixed. There have been some successes, but on the whole the impact has been less than anticipated, largely because of inadequate adaptation of technology to the varied social, institutional, economic and cultural settings.

Africa has great potential to use renewable energy sources, especially wind and solar power. Although the technology for harnessing wind and solar power is well understood, progress in its wider use in Africa is likely to be slow during the next two decades unless there is a substantial increase in public- and private sector investment. The failure to obtain firm commitments to boost efforts in this direction during the World Summit on Sustainable Development is an indication that progress in this direction in Africa is likely to be very slow.

To sum up, all the indications are that wood will continue to be the main source of energy in most of Africa. Some limited switching to commercial fuels, especially LPG

BOX 25
WEST AFRICA: CHANGING ENERGY SCENARIO

Construction of the West African Gas Pipeline (WAGP), conceived in the mid-1990s and backed by Chevron, is expected to commence in 2004. Traversing over a length of over 1000 km, the pipeline will transport gas from Nigeria to Benin, Togo and Ghana. Eventually there is a potential to extent the pipeline to Côte d'Ivoire and even to Senegal, although this will critically depend on the political stability in the region. End-use of the gas will bring extra electricity generation capacity on line, as well as promoting the use of mains and bottled gas for domestic purposes, possibly reducing woodfuel consumption significantly. Nigeria's output potential from associated gas, currently flared off with considerable environmental implications for the subregion, is estimated at 3 to 4 billion cubic feet per day, or 20 000 megawatts, roughly equalling the entire current output of the region from hydro and thermal sources combined. Moving to gas has been central to thinking at the Economic Community of West African States (ECOWAS), since the WAGP was conceived. Nigeria's gas reserves are viewed currently as virtually unlimited even in terms of known reserves, leaving aside offshore deposits, which have yet to be surveyed.

[25] A typical example of this is the Sudan. Five years ago, it was almost entirely dependent on woodfuel to meet its domestic and part of its industrial energy requirements (especially for traditional industries such as bakeries). The situation has changed dramatically during the past two years, as the country has started to exploit its oil and gas resources. A proactive policy of popularizing LPG and the active involvement of the private sector in marketing LPG have reduced the demand for fuelwood and charcoal to such an extent that it is affecting the viability of the Forests National Corporation.

and kerosene, is expected to take place in oil-producing countries, particularly in urban areas. The persistence of low incomes would, however, limit access to these for a large proportion of the population. Demand pressures from urban centres will continue to accelerate the deforestation and degradation of forests and woodlands in close proximity to cities and towns. Low returns from plantations would act as a disincentive to establishing woodfuel plantations.

INDUSTRIAL ROUNDWOOD AND WOOD PRODUCTS

Industrial wood production in Africa currently accounts for about 10 percent of total roundwood production. Considerable variations exist among the various subregions, reflecting differences in ecological conditions, demands and processing capacities. Table 8 gives an indication of the overall trend in industrial roundwood production between 1980 and 2000 and what is projected for the next two decades on the basis of the global forest products model (see FAO, 2002a, Rytkönen, 2001).

Despite data deficiencies, two aspects seem to be important as regards trends in industrial roundwood production:

- imbalances in production in relation to population;
- subregional shifts in production.

Juxtaposing population and industrial roundwood production indicates the imbalance in demand and production. Both North and East Africa are deficit subregions, while in the case of West Africa the relatively high production is more or less balanced by the high population. Southern Africa and Central Africa are the major surplus producers, the former on account of its extensive plantations and the latter on account of its natural forests.

The overall regional production of industrial roundwood is expected to grow in the next two decades and some of the subregional shifts evident during the period 1980 to 2000 are expected to become more pronounced. Southern Africa's share of industrial roundwood production, which is primarily attributable to South Africa, is expected to increase from about 35 percent in 2000 to more than 36 percent by 2020. This trend is also likely to be strengthened by an increase in logging, especially in Mozambique and Angola. West Africa and North Africa will see a marginal increase in their shares, while that of East Africa is expected to decline.

Central Africa is emerging as a major producer of industrial roundwood, although there are doubts about its long-term sustainability. Its share increased from about 16 percent in 1980 to about 18 percent in 2000, and is expected to grow to about 21.5 percent in the next two decades. West Africa's share has consistently declined, from 33 percent in 1980 to 26.6 percent in 2000. A further decline to about 23.4 percent is expected by 2020, although there may be a slight increase in the quantity it produces. The rapid increase in the proportion of industrial roundwood produced by Central Africa reflects a significant increase in logging in that subregion. The West African experience illustrates what may happen when natural forests are harvested unsustainably and when other factors accentuate resource degradation. As a result of resource depletion and the failure to adopt sustainable management practices, industrial roundwood production has decreased significantly in some countries. Many of the traditional producing countries in West Africa have already reached their limits, and countries such as Ghana are exploring the possibility of importing logs from neighbouring countries.

TABLE 8

Trends in industrial roundwood production

Subregion	1980 (million m^3)	1990 (million m^3)	2000 (million m^3)	2010 (million m^3)	2020 (million m^3)
North Africa	2.4	3.0	3.8	5.2	6.2
East Africa	6.3	8.1	10.1	10.2	10.3
Southern Africa	16.5	17.5	24.0	28.3	32.3
Central Africa	7.9	10.7	12.7	15.7	19.2
West Africa	16.9	17.4	18.2	19.7	20.7
Total Africa	**50.0**	**56.7**	**68.8**	**79.1**	**88.7**

Source: FAO, 2002a; Rytkönen, 2001.

The differences in production give an indication of the potential for increasing intraregional trade, especially taking into account the poor resource situation in North Africa and the anticipated increase in demand from countries such as Nigeria. In addition to some formal trade, there is already substantial informal trade among the various subregions and countries. Much of the trade is now with countries outside the region. Increasing income within Africa could significantly alter the direction of trade, depending on issues such as trade policies, infrastructure, and rules and regulations relating to the movement of products across frontiers.

Sawnwood production and consumption

Almost 25 percent of industrial roundwood is used as sawnwood. As in the case of industrial roundwood production, there is a considerable imbalance among the various subregions in the production and consumption of sawnwood, reflecting the uneven distribution of population, purchasing power and forest resources.

Table 9 provides an indication of the changes in production and consumption of sawnwood in 2000 and the likely trend in the next two decades.

At the regional level, sawnwood consumption in Africa is substantially greater than production. This can be largely attributed to the high demand from the relatively rich North Africa subregion, where production in 2000 accounted for only 5 percent of consumption. Some of the key differences among the subregions are as follows:

- North Africa will remain the largest market for sawnwood. Although the population is low, high per capita income and urbanization generate high demand. Much of this demand will be met from outside Africa in view of its proximity to Europe and other sources. North Africa has the potential to become a major destination for sawnwood exports from other subregions, but this will largely depend on whether transportation between producers and North African markets is improved;
- East Africa's sawnwood production will remain low because of the low productivity of the subregion. Moreover, low incomes will keep the demand depressed in the foreseeable future;
- in Southern Africa consumption is greater than production, whereas in Central and West Africa consumption is far less, creating a surplus for export. There is room for improvement of the sawmilling industry in West and Central Africa, considering the high proportion of saw logs exported.

In all the subregions, market forces dominate the production of sawnwood. The informal sector also plays a significant role in sawnwood production, although no estimates of its contribution are available. In East and Southern Africa this particularly includes pitsawing, which meets a substantial amount of the increasing demand for construction timber. In addition, many small-scale sawmills managed by local entrepreneurs play a major role in meeting local needs. These producers face a number of problems, particularly the following:

- uncertainty with regard to supplies of logs, especially as resources from easily accessible areas are depleted and more natural forests are set aside as protected areas; in most cases, capacity utilization is extremely low, especially in smaller mills;
- uncertainty regarding future operation, which discourages investment in the modernization of sawmills; most units have outdated machinery, resulting in low recovery rates; as the supply of large logs diminishes, the industry must use smaller-dimension logs, and this requires substantial changes in machinery; the pace of such changes is extremely slow;
- with economic liberalization, most urban consumers may have access to cheaper, imported sawnwood, as is already the case in North Africa; this may further reduce the incentive to modernize existing units.

In short, the current fragmentation of the sawnwood industry will persist, with much of the market share accounted for by imports of cheaper sawnwood catering to urban consumption, especially in North Africa. A sizeable proportion of demand will be met by the informal sector, especially from pitsawing. Most large sawmills in Central and West Africa will cater primarily to the demands of external markets.

TABLE 8

Trends in production and consumption of sawnwood

(consumption estimates given in parentheses)

Subregion	2000	2010	2020
	(000 m^3)	(000 m^3)	(000 m^3)
North Africa	202 (4 108)	197 (4 679)	151 (5 295)
East Africa	1039 (1083)	1118 (1196)	1228 (1334)
Southern Africa	2 221 (2 472)	2 386 (2 674)	2 528 (2 929)
Central Africa	1148 (399)	1 260 (454)	1 351 (516)
West Africa	3 057 (2 363)	3 208 (2 583)	3 248 (2 807)
Total Africa	**7 667** **(10 425)**	**8 169** **(11 586)**	**8 506** **(12 881)**

Source: Based on FAO, 2002a; Rytkönen, 2001.

Panel products

The production and consumption of panel products in Africa will be entirely determined by market forces, and this is reflected in variations in production and consumption among subregions. Table 10 shows trends in the production and consumption of panel products in Africa between 1980 and 2000 and the likely situation to the year 2020.

Between 1980 and 2000 the scale of production of panel products increased substantially, largely owing to the expansion of production in West and Southern Africa. Africa's share in the global production of wood-based panels declined from 1.5 percent in 1980 to 1.1 percent in 2000. While global production increased by about 80 percent between 1980 and 2000, Africa's production increase was about 38 percent. Some of

the key features of trends in the production and consumption of wood-based panels are as follows:

- at the regional level, the overall gap between consumption and production is expected to persist and increase over the next two decades;
- as with sawnwood, the widest gap between production and consumption will be in North Africa, where production in 2000 equalled only 40 percent of consumption. By 2020, estimated production will meet only 38 percent of consumption;
- West Africa and Southern Africa will remain the largest producing subregions, with South Africa as the lead producer. Central Africa also has the potential to become a major producing subregion, but this depends on a number of issues, especially the policies of governments and the perception of industries.

As indicated in Chapter 2, Africa has the lowest per capita consumption of panel products, about 20 percent of Asia and 10 percent of Latin America, indicating a potential demand provided that income increases. Rapid urbanization in Africa could stimulate demand, again depending on increases in income. Southern Africa (especially South Africa) and North Africa are the main consuming subregions, and this situation is unlikely to change in the next two decades.

TABLE 10
Production and consumption of panel products
(consumption estimates given in parentheses)

Subregion	1980	1990	2000	2010	2020
	(000 m^3)	(000 m^3)	(000 m^3)	(000 m^3)	(000 m^3)
North Africa	217 (503)	308 (535)	321 (802)	375 (932)	438 (1 149)
East Africa	52 (59)	87 (103)	91 (201)	104 (241)	126 (294)
Southern Africa	470 (452)	418 (347)	603 (608)	706 (765)	914 (985)
Central Africa	379 (199)	330 (144)	326 (118)	404 (156)	429 (184)
West Africa	379 (486)	438 (287)	716 (487)	755 (572)	876 (686)
Total Africa	**1 496 (1 698)**	**1 582 (1 417)**	**2 057 (2 216)**	**2 344 (2 666)**	**2 783 (3 298)**

Source: Based on FAO, 2002a; Rytkönen, 2001.

Printing and writing paper

Production of printing and writing paper is entirely guided by market forces, with purchasing power as the main driving force. Table 11 gives an indication of production and consumption between 1980 and 2000, together with projections up to 2020.

Africa's production of printing and writing paper has been far less than its consumption. For example, in 2000 production accounted for only 46 percent of consumption. Moreover, most of the production is concentrated in Southern Africa, primarily South Africa. All the indications are that South Africa will remain the foremost producer of all paper and paper products, in view of its various advantages, especially the state of its technology, its investment in forest plantations and its integration with the global market.

Trends in the pattern of consumption of printing and writing paper reflect the overall economic situation, including the literacy rate. Some substantial increase in per capita consumption of printing and writing paper is expected in Southern Africa, and by 2020 this is expected to reach about 9 kg per person per year. North Africa will be another high-demand subregion, with an estimated per capita consumption of about 2.7 kg. The other subregions will continue to have a depressed market, with a very low consumption – 0.6 kg, 0.4 kg and 0.2 kg per person for West Africa, East Africa and Central Africa respectively.

As in the case of other value-added products, the very low level of printing and writing paper consumption compared to other developing regions suggests enormous potential demand. The current per capita consumption for the region as a whole is 1.8 kg, and this is expected to increase to about 2 kg by 2020. As indicated earlier, this average conceals the enormous differences among the subregions and countries. Low demand and the fragmentation of markets will act as major constraints on increased investment in paper production in Africa. Other factors to be taken into account in assessing the scope for investment include the following:

- the worldwide capacity for pulp and paper production has expanded substantially during the past ten years, so that considerable unutilized capacity now exists in the industry. With import liberalization, increasing demand in Africa could easily be met from existing unutilized capacity elsewhere;
- on the whole, the size of pulp and paper mills has increased considerably, and technological changes have resulted in a drastic reduction in employment. In addition, processing units are moving closer to markets and away from the sources of raw material. Considering the small size of markets in Africa, demand from within the region will not support further expansion of capacity. Past experience of establishing and managing pulp and paper production is indicative of the constraints;

TABLE 11
Production and consumption of printing and writing paper
(consumption estimates given in parentheses)

Subregion	1980	1990	2000	2010	2020
	(000 tonnes)	(000 tonnes)	(000 tonnes)	(000 tonnes)	(000 tonnes)
North Africa	135 (217)	170 (348)	113 (488)	248 (550)	323 (644)
East Africa	19 (24)	37 (54)	29 (88)	29 (102)	29 (119)
Southern Africa	180 (287)	396 (456)	515 (671)	881 (880)	1 289 (1 349)
Central Africa	0 (8)	00 (9)	0 (15)	0 (23)	0 (27)
West Africa	0 (52)	0 (88)	1 (154)	1 (176)	2 (201)
Total Africa	**334 (588)**	**603 (955)**	**658 (1 416)**	**1 159 (1 731)**	**1 643 (2 340)**

Source: FAO, 2002a; Rytkönen, 2001.

- if employment generation is an important consideration, the pulp and paper industry is not an appropriate option for most countries in Africa.

These economic and technological considerations suggest that, at this stage, it may not be advantageous for Africa to expand its capacity for pulp and paper production significantly, except in the Southern Africa subregion (primarily South Africa, whose pulp and paper industry is well developed and globally competitive). Many of the constraints stem from lack of demand, largely because of low income and the fragmented nature of the market.

AFRICA IN THE GLOBAL TRADE IN WOOD AND WOOD PRODUCTS

Inasmuch as Africa has about 16.8 percent of the world's forested area and 13 percent of its population, it is important to consider the role of its forests in global trade. Between 1980 and 2000 the value of worldwide exports of all forest products rose from about US$ 57 billion to US$ 143 billion. Africa's share of exports of such products in 1980 was US$ 1.6 billion, and although this nominally increased to US$ 2.9 billion in 2000, there was a substantial decline in Africa's share. Table 12 provides an overview of Africa's share in the value of global trade in selected forest products.

As shown in Table 12, Africa's share in global trade is extremely low. Exports decrease as the degree of wood processing and value addition increases. Thus, although Africa accounts for about 9 percent of industrial roundwood exports, its share of the printing and writing paper trade is just 0.02 percent, much of it accounted for by South Africa. African imports, on the other hand, indicate a higher proportion of value-added products, primarily because of the large amount imported by the forest-poor North Africa. Global trends in forest product trade indicate a very rapid growth of trade in manufactured items, especially paper and paper products. For example, in 1980 the total value of forest product imports was US$ 63.3 billion, of which paper and paperboard accounted for about US$ 20.9 billion. By 2000 the total value of all forest product imports reached about US$ 153 billion, of which paper and paperboard accounted for about US$ 70 billion. On the other hand, the share of less processed items, such as industrial roundwood and sawnwood, declined substantially. The fact that the African forest industry (except in South Africa) is geared to the production of low-value-added items indicates the constraints on increasing its share of the global trade in forest products.

Interestingly, although Africa's share in global forest products imports and exports is low, they are very high as a proportion of domestic consumption and production respectively. This reflects the high degree of openness, as well as subregional differences in production and consumption. North Africa has low levels of production because of its poor resource base, but a high demand on account of its relatively high income, whereas Central and West Africa, and to some extent Southern Africa, have a low internal demand (because of low incomes), necessitating exports to make the forest industry viable and competitive.

Considering the uncertainties of global trade, it is hard to see how Africa's role in the forest product trade will change. The current low level of consumption of several products suggests the potential for increased consumption as income increases. However, such an increase is critically dependent on high income growth rates and more particularly overall social and economic development, including improvements in literacy. The other questions are whether Africa has a future in the trade in wood and wood products in the next two decades and what real benefits will accrue to the

TABLE 12
Africa in global trade of selected forest products in 2000 (in percentage)

Product	African imports as a proportion of global imports (in value)	African exports as a proportion of global exports (in value)	Imports as a proportion of African consumption (in quantity)	Exports as a proportion of African production (in quantity)
Industrial roundwood	1.2	9.1	1.5	8.9
Sawnwood	3.3	2.6	47.4	21.4
Wood-based panels	1.3	1.6	38.29	34.02
Paper and paperboard	2.2	0.6	47.4	21.4
Printing and writing paper	2.1	0.02	54.4	1.4

Source: FAO, 2002a.

countries and people from trade. Much of the trade still consists of low-value-added items, and there are concerns about the long-term sustainability of these, especially since the proportion of wood obtained from sustainably managed areas is very limited. A substantial proportion of export income is generated by foreign-owned firms, and once the proportion of profit repatriated is taken into account, what actually remains within the countries may be limited.

FUTURE OF NON-WOOD FOREST PRODUCTS

A range of situations involving a combination of different scenarios can be envisaged as regards the future of non-wood forest products, depending on their properties, markets and production systems. While production and trade in major products such as gum arabic take place largely in the market- forces scenario, the public sector may also play a considerable role (as in the case of the Gum Arabic Company in the Sudan). However, a substantial number of products are collected, produced and traded in the informal sector, largely catering to subsistence consumption. The emerging situation can be summarized as follows:

- a number of products traditionally collected and consumed by local communities are likely to become scarce on account of the overall depletion of woodland resources. Most of these will remain in the realm of the informal sector, catering to low-income consumers. Whether some of these will be domesticated and cultivated will depend on the availability of substitutes, especially in the case of medicinal plants, and price changes that make it profitable to invest in cultivation and processing;
- the prospects for several products that have a global market will depend on the changing demand and supply situation. In view of increasing emphasis on natural products, many of these will be cultivated on a commercial scale. A few private companies will attempt to monopolize production, processing and trade in such products. The dependence of these

BOX 26

SCENARIOS WITH REGARD TO DEVELOPMENT OF THE MEDICINAL PLANT INDUSTRY IN SOUTH AFRICA

Based on an in-depth study of medicinal plant use in Kwazulu-Natal in South Africa, Mander has identified the potential future scenarios for the medicinal plant industry:

"The study identified three potential scenarios which could develop depending on the actions of key role players in the markets. The possible scenarios are as follows:

Scenario 1 – No intervention – the continuation of status quo – where there is limited investment in promoting the supply of popular plants to the current market players. Consequently, large commercial interests are likely to cultivate high-value plants and trade processed products, while most of the current market players continue to compete for a decreasing share in a declining stock of popular plants. A narrow range of species will be cultivated, processed and distributed for the upper end of the market with a small number of large business interests benefiting. Biodiversity and healthcare would be negatively impacted.

Scenario 2 – Industry driven intervention – collaboration between progressive and current market players and skilled business interests – is likely to offer larger benefits to large intermediate companies and to a limited number of market players. Cultivation, processing and distribution would occur for the middle and upper end of the market. Small-scale traders and gatherers are likely to continue to trade in wild plants, but supply is likely to decline as consumption of cheap products continues at the lower end of the market. Biodiversity and healthcare would be negatively impacted.

Scenario 3 – Collaborative intervention – collaboration between current market players, government and business interests – could see the development of a wide range of processed products from simple rural products to sophisticated industrial products. Numerous market players could develop a range of different quality products for a wide range of consumers, with different prices suited to the consumers' budgets. Such a scenario is likely to promote the growth of the industry and promote development at a broad scale. Investment in resource management is also likely in this scenario. Health could also benefit.

The most likely scenario to develop without market interventions is number 2, where big business enters the market and leads market development to suit its own objectives. Current investments by both government and big business are supporting the development of this scenario. Furthermore, current legislation supports the corporate sector by excluding the less developed market players from producing more commercialized indigenous plant products. The costs of this scenario will be borne largely by the current consumers who will lose access to basic consumer goods through price increases and scarcity, and market players will lose access to trade products."

(Mander, 1998)

products on global markets will bring considerable volatility to prices;

- Africa has considerable untapped potential for new products on account of its biodiversity. Realizing this potential will, however, depend on Africa's ability to: conduct bioprospecting; invest in improving its wealth of traditional knowledge, especially strengthening its scientific and technological base; and prevent biopiracy by improving policy, legal and institutional frameworks. In the absence of significant public sector intervention, the prospects for positive change are uncertain.

If the present trend persists, the contribution of non-wood forest products to the welfare of people is unlikely to be substantial. In the context of informal sector dominance, overexploitation of forests and woodlands is likely to intensify. On the other hand, market opportunities for some products may result in their domestication and cultivation. The policy and institutional environment will determine the extent of benefits accruing to the poor from such developments. Persistence of the present situation in many African countries suggest that benefits from emerging opportunities are likely to be appropriated by a few, although this may change, depending on the progress of adoption of community management and the improved ability of local institutions to manage the resources sustainably.

WILDLIFE-BASED TOURISM: OPPORTUNITIES AND CONSTRAINTS

Wildlife is undoubtedly one of the unique natural resources of Africa, with considerable potential for contributing to rural development through employment and income from tourism, and also as a source of food, especially bushmeat. In assessing the future of wildlife management in Africa, the most important questions to be considered are:

- Will there be any changes in the extent of protected areas and game reserves?
- What will be the qualitative changes in the management of protected areas?
- What will be the economic and social viability of protected areas?

Answers will depend on the specific situation in each country and how the driving forces and institutional and policy scenarios alter the path of development.

Most national parks and other protected areas in Africa are under public ownership and control, although the overall decline in the capacity of the public sector is affecting the quality of management. The informal sector also significantly affects wildlife resources, especially through poaching for bushmeat and products such as ivory, rhinoceros horn and skins, and the illegal trade in live animals and plants. While some bushmeat production is for local subsistence consumption, it is increasingly being commercialized to meet the growing demand from urban centres, including some outside Africa. Increasing conflicts on account of poaching and encroachment on protected areas have in some instances led to the emergence of a fortress scenario, with stringent protection measures, including the erection of barbed-wire fences and the deployment of armed guards to combat poaching.

The other approach that has been attempted, although to a limited extent, is the involvement of local communities. The private sector is also playing a major role in the management of national parks and game reserves. In many cases the provision of services to tourists is handled by the private sector. There are several privately owned parks in Southern and East Africa, many of which have been established on the extensive farm woodlands appropriated from local communities during colonial times and now risk changes in the wake of land reforms. A number of publicly managed parks have been commercialized, involving the private sector in managing different components. Assuming that the combination of public sector, informal sector and market forces persists, the situation that is likely to emerge in the next two decades is indicated below.

Changes in the extent of protected areas

In view of the increasing pressure on forests and intensification of land use conflicts, the scope for further expansion of protected areas is limited, except possibly in the Central Africa subregion, especially the Congo basin. Even if new protected areas are formed, governments may have difficulty in managing them effectively.

Qualitative changes in management

Improvement in habitat conditions and enhancement of the value of parks and game reserves require substantial investment, and this will depend largely on institutional arrangements. If the present trend continues, a further weakening of public sector capacity and a consequent decline in the quality of management can be expected. Privatization and commercialization may provide some respite, but they could also have a distorting effect, with much of the attention being centred on commercially viable segments, to the neglect of long-term efforts such as habitat improvement. One important development in

BOX 27

COMMUNITY-BASED CONSERVATION PROGRAMMES: POTENTIAL AND CONSTRAINTS

New community-based conservation programs (CBC), that presently have been developed as a hope for better conservation, do not have a long operational history to evaluate them rigorously, but seem already to have some limits. Nevertheless, CBC represents an advance over past practices that ignored rural people. Community-based conservation programs have as their goal the transformation of the relationship between rural people and the environment, and they draw on natural resources to produce revenue for local communities. Yet the widespread application of CBC programs in Africa is questionable because of rapid human population growth and widespread poverty. It is doubtful that the economic return to rural people from CBC programs can be high enough that people will not eventually look for economic alternatives. In this conception, CBC is both a wildlife conservation and economic development program, with all the complexity inherent in such an effort. In Africa's conditions, the programs are exceedingly difficult to administer, and the simultaneous achievements of social, economic, and conservation goals is problematic.

(Czudek, 2001)

recent years has been the establishment of transboundary parks, involving both the public and private sectors in adjoining countries. This is helping to address common issues, including poaching and other transboundary problems, as well as coordinating divergent policies and approaches to park management.

Benefits from the management of national parks and game reserves

While national parks and game reserves fulfil biological, scientific, cultural and social functions, in a resource-constrained situation their economic viability becomes critical – and this will largely be a function of the demand for and supply of products and services. As elsewhere, tourism and to some extent bushmeat are probably the most important economic benefits drawn from wildlife.

A substantial proportion of tourism in Africa is accounted for by international visitors, although there has been some increase in the number of tourists from within Africa in recent years. The economic viability of wildlife-based tourism will be affected by a number of factors, especially the overall global situation, including income. Wildlife-based tourism in Africa will depend on:

- the growth of tourism at the global, regional and national levels, which is largely related to increases in disposable income[26];
- the expectations of tourists;
- infrastructure facilities;
- perceptions of safety and security[27].

Global tourism registered very rapid growth between 1995 and 2000, with tourist arrivals increasing from 565 million in 1995 to 698 million in 2000 (World Tourism Organization, 2001). The World Tourism Organization estimates the growth rate for the period 1995 to 2020 as 4.1 percent in global terms and 5.5 percent in Africa. Africa's share of the global tourism market is expected to increase from 3.6 percent in 1995 to 5.0 percent in 2020, with the number of visitors increasing from 20.2 million in 1995 to 47.0 million in 2010 and 77.3 million in 2020. However, recent events have seriously affected travel and tourism. Although the global economic slowdown and the loss of disposable income, which were already evident prior to the events of 11 September 2001, have affected the sector temporarily, most forecasts suggest the continued long-term growth of tourism.

Infrastructure development will be a key factor in the growth of tourism. Differences in this regard among countries and subregions are expected to persist, with most tourism-related benefits accruing to countries such as South Africa. In countries with limited infrastructure, there may be some growth of adventure tourism, but since this is a limited niche market, the overall income that may be generated is likely to be low. Issues such as safety and security will be an overriding concern for a number of countries. It should also be noted that tourism is highly vulnerable to changes in the external environment.

An important issue connected with the growth of tourism is the sharing of benefits, which will largely depend on institutional arrangements. When the indigenous private sector is poorly developed and monopolistic tendencies exist, the gain to local communities may be limited. In a number of countries, efforts are under way to address this problem, largely by

[26] International tourist arrivals in 2000 were estimated at 698.4 million. Receipts from international tourism stood at US$ 475.8 billion. Africa accounted for just 4 percent of all tourist arrivals and 2 percent of tourism receipts. South Africa accounted for about 22.7 percent of the tourist arrivals in Africa.

[27] The perception of security could drastically alter tourist arrivals, as evidenced by the experience of Zimbabwe, which registered a 60 percent decline between 1999 and 2000 (World Tourism Organization, 2001).

BOX 28

THE CAMPFIRE PROGRAMME IN ZIMBABWE

One of the best known collaborative programmes can be found in Zimbabwe, where the Communal Areas Management for Indigenous Resources (CAMPFIRE) Programme is devolving power over wildlife and other resources to local people. Its success is attributed to the tangible benefits from wildlife that accrue to local communities. These benefits generate increased local support, which has enabled the programme to embrace other communal resources such as grazing, water and woodland. Despite the wide acclaim it has received, CAMPFIRE has not been without problems. It has to operate within a confusing institutional framework with unclear structures. An independent assessment found that the impact on individual household income has fluctuated considerably, but has on average been low and insufficient to compensate for the damage done by wildlife. The assessment also noted examples of financial abuse by some individual community leaders and found that very little infrastructure could be attributed to CAMPFIRE – and some that resulted from CAMPFIRE was found to be poorly planned (e.g. silted up dams). There has undoubtedly been an increase in the capacity to plan and implement projects at the community level, but the rapid expansion of CAMPFIRE has meant that training resources have been thinly spread.

(Dubois and Lowore, 2000)

developing participatory approaches (see Box 28).

Bushmeat is a vital source of nutrition and income for many people, especially in rural Africa. While most subsistence consumption has a limited impact, increasing commercialization, largely to meet the urban demand, is undermining long-term sustainability. No realistic estimates are available on wildlife stocks and sustainable harvest levels. Apart from organized culling and trophy hunting, most bushmeat production takes place in the informal sector. Ever-increasing public access, use of highly destructive technology and the rapid spread of arms and ammunition are increasing the toll on wildlife hunted for bushmeat. The increasing commercialization of bushmeat production, the dominance of the informal sector and the weakening of public sector institutions indicate a continued depletion of wildlife.

In summary, if the rich wildlife resources of Africa are to provide their potential benefit, improvements in management will be needed, including substantial investments in infrastructure, as well as institutional improvements to reduce conflicts and more particularly to increase the benefit to local communities, especially through the sharing of income from tourism. The current dominance of the informal sector and the narrow focus of the private sector, however, could have several negative effects that would undermine the potential benefits.

PROVISION OF ENVIRONMENTAL SERVICES

Watershed protection, the arresting of land degradation – especially desertification – and biological diversity conservation are some of the major environmental benefits provided by African forests and trees. With increasing urbanization and a deteriorating urban environment, there is considerable awareness of the need to increase tree cover in cities and towns. In arid and semi-arid areas, the provision of shade to people and livestock is another critical function; indeed, the importance of shade is well recognized by local communities, resulting in substantial planting on homesteads and in public areas in villages and towns. Almost all of these services fall into the broad category of public goods, although their significance may differ at the local, national, subregional and regional levels.

The key issue as regards the outlook for the environmental services is whether there will be any improvement in the situation during the next two decades as a result of wider awareness and, more important, global efforts, including various conventions and treaties. This will largely depend on the driving forces and dominant policy/institutional scenarios:

- although the public sector is expected to play a lead role in protecting the environment and addressing issues such as desertification control, watershed management and environmental protection, most often efforts in these directions are far from adequate. Within the public sector, the objectives of various units (ministries and departments) diverge, and environmental considerations are seldom incorporated into their functions. Increasing concern for environmental protection often manifests itself in the establishment of a ministry or department to coordinate or address environmental issues, but as long as the key ministries and departments fail to address the issue, the environment ministry or department is unable to accomplish its objectives. Fragmentation of the environmental agenda among various government units has undermined the ability of the public sector to play a lead role. With declining resources in most African countries, the public sector will be

BOX 29

OPTIONS FOR WILDLIFE RESOURCE MANAGEMENT IN EQUATORIAL AFRICA

Given the public goods aspects of wildlife in Equatorial Africa, land and resource privatization (promoted as solutions to wildlife management elsewhere) may be insufficient in themselves. Devolving ownership of wildlife without effective institutional incentives to promote equity and sustainability could well marginalize large numbers of wildlife users. The common access and usufruct rights which they currently enjoy (even if by default) may be threatened, rather than supported, by changes in land tenure regimes.

Equally, there is no guarantee that solutions based on reinstating traditional control systems will necessarily provide any easy institutional base for effective management of the resource. Global integration, monetization of economies, growing land and labour transactions and social complexity, combined with increasing pressure on natural resources, all change images of communities as cohesive entities. This casts doubts on the notion that leaders and followers share a basic commonality of purpose.

If wildlife conservation is to contribute to people's livelihoods, new forms of ownership must be found which do not rely on overambitious land reforms or the restitution of traditional controls.

(Inamdar *et al.*, 1999)

BOX 30

IMPACT OF WATERSHED DEGRADATION IN THE NILE BASIN

The high rate of deforestation and poor land management in the Nile catchments in Ethiopia, Eritrea and the Sudan are affecting the irrigation system and urban water supply in the Sudan. The water supply system for Khartoum is designed to treat a sediment load of up to 80 ppm, but in recent years the sediment load has gone up to 280 ppm, making the existing treatment facility ineffective. The Ministry of Water Resources and Irrigation spends more than half its annual budget on removing silt from the main canals. The Kashmal Girba reservoir commissioned in 1964 has lost almost half its storage capacity as a result of siltation.

(Abdel Nour, 2002 Personal communication)

hampered in its efforts to play a lead role in addressing environmental issues, regardless of the various conventions and protocols;

- in the absence of an effective public sector that lays down policies and regulations to protect the environment and ensure compliance, it is unlikely that market forces will be able to bring about any significant improvements. Although some efforts are been made towards the evaluation and pricing of environmental goods and services, the scope for their wider application and any consequent improvement in the environment is limited. The market mechanism largely functions in the context of consumers' willingness to pay for the goods and services, and the ability to exclude those who are unable to pay. Low income and institutional weaknesses limit the effectiveness of market forces in addressing environmental problems, even if the issues of quantification and evaluation are addressed;
- although local communities operating largely in the informal sector have traditionally addressed environmental issues, this situation is breaking down for a variety of reasons. Increasing population, poverty and poor access to technology, coupled with the breakdown of traditional systems of community control, have resulted in overexploitation of resources, accelerating land degradation, desertification and biodiversity loss. Unless community management is reinvented and adapted to the emerging changes, there is unlikely to be any improvement in the situation;

All the indications are therefore that:

- negligible progress is likely to be achieved in arresting land degradation and desertification;
- watershed degradation will persist, with its severe costs in the alteration of water regimes, often substantially reducing water availability;
- continued loss of biodiversity will result from deforestation and overexploitation of plants and animals.

ROLE OF AFRICA IN THE PROVISION OF GLOBAL PUBLIC GOODS

Global climate change arising largely from the increasing concentration of green-house gases is a major environmental issue. Forest is probably the terrestrial ecosystem that does most to reduce the pace of carbon accumulation through sequestration and storage (see Box 31). The Kyoto Protocol includes afforestation and reforestation as options for carbon sequestration, although the technical and institutional aspects of monitoring sequestration and trading credits are yet to be worked out. The role of African forests in combating global climate change needs to be considered in this context. It is often pointed out that carbon sequestering plantations open up new avenues for the mobilization of substantial financial resources, especially under the Clean Development Mechanism

BOX 31

OVERVIEW OF TERRESTRIAL CARBON MANAGEMENT STRATEGIES AND POTENTIAL LAND USE AND FOREST ACTIVITIES

Carbon management strategy	Type of land use and forest activity
Carbon sequestration	Afforestation, reforestation and restoration of degraded lands Improved silvicultural techniques to increase growth rates Implementation of agroforestry practices on agricultural land
Carbon conservation	Conservation of biomass and soil carbon in existing forests Improved harvesting practices (reduced-impact logging) Improved efficiency of wood processing Fire protection and more effective use of burning in both forest and agricultural systems
Carbon substitution	Increased conversion of forest biomass into durable wood products for use in place of energy-intensive materials Increased use of biofuels (e.g. introduction of bioenergy plantations) Enhanced utilization of harvesting waste as feedstock (e.g. sawdust) for biofuel

(Bass *et al.*, 2000)

(CDM). Considering that the carbon market is yet to develop and that the major contributor to CO_2 emission has opted to remain outside the framework of the Kyoto Protocol, there is some concern about the future of investments under CDM, especially the extent of resources available.

Africa has considerable potential to contribute to carbon storage through conservation and improved management of its vast tropical forests, especially in Central and West Africa. However, conservation to maintain carbon storage capacity is at present outside the purview of CDM. Only afforestation or reforestation will attract financial support under CDM. There are indications that Africa may not be able to benefit greatly from this if the present arrangements persist. Considering that funds under CDM are unlikely to be substantial, the ability of Africa to take advantage of CDM will largely depend on its comparative advantage as perceived by the providers of CDM funds. Some of the key issues in this regard are indicated below.

Land availability

A large part of Africa is arid and semi-arid with very low productivity, making it unsuitable for high-productivity plantations. In particular, North Africa, East Africa, large parts of Southern Africa and the dry zone of West Africa have very little potential for high-productivity reforestation or afforestation alternatives, which would significantly increase the unit cost of carbon sequestration. Considering population growth and the intense land use pressure in humid West Africa, it would be hard to set aside a large area for carbon sequestering plantations for a long period. This leaves only Central Africa, especially the Congo basin, where growing conditions are satisfactory and population pressure is low. However, in the Congo basin the main problem is unsustainable management of existing forests. Improved forest management, especially the application of reduced-impact logging, is a much better option in Central Africa, although support for forestry-related solutions to global warming does not extend to conservation.

Carbon trading in the market forces scenario

Carbon trading largely takes place in a situation of limited funds, and this increases the bargaining power of those investing in carbon plantations. This will inevitably favour countries with a large amount of highly productive land and cheap labour and where risks are perceived to be very low. At least in the initial stages, most of Africa may not be in a position to compete with other continents, especially South America and even some parts of Southeast Asia. The better informed carbon trading companies will be able to drive the prices down, with most countries receiving very limited benefits from allocating land and labour for carbon plantations.

The main issue of setting aside land to provide global public goods is that it involves social, economic and environmental costs that need to be compensated for by the global community. The limited experience of some afforestation/reforestation efforts in Uganda and Tanzania indicates the constraints in this regard[28]. The fact that foreign direct investment in Africa has been very low, in spite of higher returns on investment, indicates that there are limitations to CDM's becoming a major source of funds for afforestation and reforestation in Africa.

Carbon trading: the future

The other issue to be considered is the long-term prospects of carbon markets and what is likely to emerge as a result of technological changes. It is particularly important to consider the emergence of improved technology for power generation, including the sequestration of carbon at its source, and the wider use of renewable energy sources, especially solar and wind energy. All the indications are that these options are being vigourously pursued, making carbon

[28] Afforestation programmes implemented in Uganda and Tanzania have been criticized for neglecting their social and environmental implications.

sequestration by trees less important in the long term.

Under the present CDM framework, Africa's comparative advantage in providing global public goods may therefore be limited. Only when conservation and sustainable management are considered as eligible for support under CDM will Africa be able to take advantage of its significant contribution to the stabilization of carbon stocks.

ROLE OF FORESTRY IN POVERTY ALLEVIATION

The extent of poverty in Africa was outlined in chapter 3. Most studies suggest a worsening of the situation if the present trends persist. In 1990, sub-Saharan Africa had 242 million poor people – those who live on US$ 1 or less per day. By 1998, their number had increased to 302 million. Estimates suggest that by 2015 this number could increase to between 361 and 420 million, depending on the per capita GDP growth rate (World Bank, 2001)[29].

The role of forests and trees in poverty alleviation is multidimensional (Arnold, 2001). As living standards rise, the nature of dependence on forests tends to change. For most poor people, forests are a major source of products and income. Access to forest resources such as woodfuel, medicinal plants, bushmeat and other foods is critical. The role of forests and woodland in poverty alleviation and how this is expected to change during the next two decades has to be examined in this context. The likely future situation with regard to forests and poverty alleviation is indicated below:

- despite the efforts of the public sector to increase employment and income, unemployment is expected to remain high, especially in the context of low investment in the productive sectors. This indicates continued dependence of poor people on forests and woodland for a variety of products – woodfuel, medicinal plants, bushmeat and other non-wood forest products – to meet subsistence consumption needs or for sale to generate cash income;
- the effect of the emergence of market forces varies. While economic liberalization has the potential to increase opportunities, it may also have negative effects, especially when increased imports

BOX 32

FOREST OUTPUTS AND RURAL LIVELIHOODS

Characteristics of livelihood inputs from forests	Effects of change on livelihood inputs from forests
Subsistence and cultural importance	
Forests form an integral part of the social and cultural framework of forest-dwellers.	Likely to weaken, but persists widely in some aspects (e.g. medicinal plants).
Forest products supplement or complement inputs of fuel, food, medicinal plant products, etc. from the farm system; often important in filling seasonal and other food gaps, particularly in hard times; forest foods enhance palatability of staple diets and provide vitamins and proteins.	Can become more important where farm output and/or non-farm income declines. Likely to decline in importance as government relief programmes or new agricultural crops make it less necessary to fall back on forest resources, as incomes rise and supplies come increasingly from purchased inputs, or as increasing labour shortages/costs militate against gathering activities or divert subsistence supplies to income-generating activities.
Agricultural inputs	
Forests provide a starting point for rotational agriculture and protection; on-farm trees also provide shade, windbreaks and contour vegetation; trees and forests also provide low-cost soil nutrient recycling, mulch, arboreal fodder and forage, fibre baskets for storing agricultural products, wooden ploughs and other farm implements.	Trees can become increasingly important as a low-capital means of combining declining site productivity and a low-labour means of keeping land in productive use (e.g. home gardens). However, increased capital availability and access to purchased products are likely to lead to replacement by other materials (e.g. pasture crops, fertilizer or plastic packaging).
Commercial outputs	
Forests help diversify the farm household economy, providing counter-seasonal sources of income and a source of income in hard times. Many products are characterized by easy or open access to the resource, and low-capital and low-skill entry thresholds; overwhelmingly small, usually household-based activities, mainly low-return, producing for local markets, engaged in part time by rural households, often to fill particular income gaps or needs; limited growth potential, but very important in the coping strategies of the poor; often particularly important for women (as entrepreneurs as well as employees). Some forest products provide the basis for full-time and high-return activities; usually associated with high-skill and high-capital entry thresholds, and urban as well as rural markets.	With increasing commercialization of rural use patterns, some low-input low-return activities can grow; however, most are inferior goods and will decline. Some are displaced by factory-made alternatives, and others become unprofitable and are abandoned as labour costs rise; gathered industrial raw materials tend to be replaced by domesticated supplies or synthetic substitutes. Higher-return activities serving a growing specialized demand are more likely to prosper, particularly those serving urban as well as rural markets; an increasing proportion of the processing and trading activity is likely to become centred in small rural centres and urban locations.

(Arnold, 2001)

[29] The lower figure assumes an annual growth rate of 3.7 percent in per capita GDP. Taking into account the annual population growth rate of 2.8 percent, this would require an annual GDP increase of ·/·· ·/··6.5 percent f the experience of the 1990s is any indication, most countries are unlikely to achieve such a high growth rate. .

undermine local production and employment. In many cases, export-oriented production requires substantial investment far beyond the means of the poor;
- the informal sector with its multitude of transient activities is expected to continue to play a major role in producing goods and services required by the poor and in generating employment and income.

All the indications are that in the absence of substantial growth of agriculture and other sectors and with the continued increase in the number of the poor, forests and other easily exploitable natural resources will remain a major resource to fall back on to provide basic-needs goods such as woodfuel, medicinal plants and other forest products. This will be particularly so during periods of natural disaster such as floods and droughts. With HIV/AIDS undermining the economies of many countries, the dependence on forests is expected to increase substantially.

CONCLUSION

What has been outlined above largely reflects the outcome if the business-as-usual situation prevails, with a combination of some of the negative elements of the public sector dominance, market forces dominance and informal sector dominance scenarios. While the public sector has historically dominated most resource-management decisions, there are indications of its declining role. Although institutional changes are taking place, the private sector is seldom able to play a positive role. In the absence of a level playing field and a strong regulatory mechanism, market forces operating in an inequitable society exacerbate poverty, and resources are directed to meeting the demands of the rich. While the informal sector provides substantial income and fulfils people's basic needs, it also faces constraints, largely stemming from the low level of technology and from resource depletion. A combination of these factors would lead to the following situation:

- the extent of forest cover will continue to decline, probably at the same rate as in the 1990s;
- although there may be some improvement in the area under sustainable forest management, large tracts of forest will continue to be managed unsustainably;
- most industrial wood will continue to be obtained from natural forests, and the switch from natural forests to plantations and trees outside forests could be slow, except in some countries where local industries are developed and land tenure is better defined;
- woodfuel will remain the primary source of energy and the largest use of wood; consumption of woodfuel is expected to increase in line with population growth;
- the demand for industrial wood and other products will grow, especially in North Africa and to some extent in Southern Africa; low purchasing power will continue to dampen any growth in consumption in other subregions;
- despite the large extent of forests, Africa is unlikely to become a major source of wood and wood products, and also it is unlikely to become a major market; an increasing amount of the trade is in processed items, and in the absence of investment in processing, Africa's ability to become a lead player in the global trade in forest products will remain limited;
- the constellation of change drivers and scenarios will continue to undermine the ecological functions of forests, and problems such as watershed degradation, desertification and loss of biological diversity are expected to persist and even worsen;
- although African forests play a critical role in the provision of global public goods, this is unlikely to increase resource flows, especially under the Clean Development Mechanism;
- poverty alleviation will remain a key role for forests, especially on account of the high dependence of rural people on them; however, most activities contributing to basic needs are in the informal sector, imposing constraints such as sustainability and the low levels of consumption and income these activities generate.

The long-term outcome of this situation is patently undesirable, and there is an urgent need to explore alternatives. Chapter 6 outlines what needs to be done to pursue the Great Transition scenario, elements of which are already seen in some countries.

BOX 33

AFRICANS' VIEW OF THEIR FORESTS

A survey was conducted within the framework of the FOSA exercise to collect information on the views of a wide range of players (government agencies, universities, various institutions, international agencies, non-governmental organizations and the general public) with interests in forests and the forest sector. A questionnaire was drawn up, with 4 731 copies being distributed in Africa. The response rate was more than 13 percent, giving views from 43 African countries. The details of these 620 responses are as follows:

by subregion

North Africa	East Africa (+ islands)	South Africa	Central Africa	West Africa
33	126 (+ 12)	70	65	255

by socio-professional category

Government agencies	Universities and research institutes	NGOs and associations	Private sector	Others
143	113	250	31	24

Forests today

The main responsibility for the management of forest goods and services lies with governments, but it appears also that other actors have a role to play. Responses from West and Central Africa consider that farmers and local communities should be taken into account concerning the various issues related to forest products, while those from North and East Africa consider that such participation should be limited to the production of non-wood forest products. Moreover, the importance of the private sector was stressed only by those from the West and Southern Africa subregions.

With regard to the adequacy of goods, judgements are mixed: while those from Cameroon and Gabon express satisfaction with their wood supply, those from Burkina Faso, Ethiopia, the Gambia and Rwanda are concerned over the shortage of timber and woodfuel. The Maghreb countries also question their possibilities of ensuring the supply of pulp and paper. Views on access to non-wood forest products also differ, with an expression of satisfaction over medicinal plants and non-satisfaction over forest-derived items in West Africa – and the high demand for bushmeat is in fact a problem in Cameroon and the Congo.

Lastly, the great majority of answers considers that efforts to protect watersheds, wildlife or biodiversity as well as to control desertification are ineffective.

Regarding the state of forests, deforestation is commonly reported, as seen in a loss of forest area and cover, and an overexploitation of forest products. Moreover, soil erosion, desertification and the inefficiency of reforestation activities are visible in numerous countries.

The main causes are given as wood cutting (for timber and woodfuel), encroachment and the lack of sustainable forest management. Although pastoralism, illegal activities and corruption are mentioned in several subregions, many North African responses stress forest and woodland fires, and climatic constraints (water limitations).

The critical factors affecting the state of forests are widely recognized as being demographic growth, poverty and energy needs, with the inefficiency of national institutions also being mentioned.

The future of the forest sector

Most of those who answered the questionnaire are pessimistic. Forest reduction and degradation will continue because of the lack of means and management. The main concerns are seen as biodiversity loss, water scarcity and desertification. Depletion of forest resources will affect living conditions and local wood industry; several African countries may in particular face a decline in their timber industry and trade. Unlike other countries, Tunisia and South Africa believe that their forest situation has stabilized or has even improved with current efforts regarding tree planting and the adoption of a participatory approach.

Throughout Africa, improvement or stabilization of forest status is considered possible, but would require:

- natural resource management, using a participatory approach;
- intensification of afforestation/reforestation (through community action and farmers' commitment);
- extension work on environmental issues, as well as technical training.

Substantial efforts are also needed to:

- increase institutional effectiveness;
- fight against corruption and illegal harvesting;
- strengthen decentralization and a participatory approaches;
- ensure ownership and other land use rights.
- develop energy alternatives to woodfuel;
- develop markets for non-wood forest products.

In conclusion, there is a call for a coherent forest and tree management policy with long-term action. Most respondents however recognise the constraints arising from population growth and poverty, wich will be compounded by the effects of the AIDS pandemic.

Chapter 6

The great transition: priorities and strategies for forestry

It was seen in the previous chapter that if the business-as-usual scenario continues, the forestry situation is likely to deteriorate further. Deforestation will continue unchecked, sustainable forest management may not be adopted widely, and the flow of goods and services could diminish substantially. Resource use conflicts will be aggravated, undermining the social, economic and environmental functions of forests. A multitude of actors, largely acting on the basis of narrow self-interest, will undermine the long-term potential of forests to contribute to social, economic and environmental well-being.

This suggests the need for concerted action to move away from the business-as-usual approach to a scenario that will empower all the key actors. As discussed in earlier chapters, there are already several initiatives and efforts that, although fragmented, address some of the concerns. Various ongoing initiatives, particularly NEPAD, are providing a context in which the Great Transition could be accomplished. This chapter aims to provide a broader and more coherent framework for the sector as a whole to facilitate the Great Transition.

PRIORITIES FOR THE FOREST SECTOR

Although the African situation warrants a different approach, forestry development in the continent has followed the conventional paradigm, largely attempting to adopt concepts, approaches and practices followed elsewhere. In the past, most forestry activities in Africa were concentrated on resource exploitation, assuming that this would pave the way for development. This approach has not helped to increase the contribution of forests and forestry to the well-being of the people, nor empowered the latter to manage the resources sustainability. The outcome has often been the opposite. The Great Transition as described earlier would require correcting the shortcomings, focusing on some key ultimate goals and reorienting forestry appropriately. Considering the current and anticipated situation in Africa, the main objectives of forestry will be:

- to address poverty by giving priority to meeting the basic needs of the poor, specifically focusing on producing the goods and services they need, generating employment and income that will help to improve their access to these goods and services, and reducing their vulnerability to economic and environmental changes;
- to arrest environmental degradation, in particular improving watersheds, combating desertification and protecting biodiversity.

Forestry and poverty alleviation

Although forestry alone will not be able to address the root causes of poverty, the increasing dependence of the poor on forests means that forestry must address this issue more directly. Of particular importance is the need to support and improve the livelihood of the large number of forest-dependent people who are vulnerable to environmental changes and who seldom benefit from conventional forestry development. The following specific aspects require attention:

- *the sustainable production of goods and services required by the poor,* ensuring that land use changes do not significantly alter their long-term availability; particular attention must be given to meeting demands for woodfuel, non-wood forest products including medicinal plants, bushmeat, and wood products, especially construction material, poles, etc.;
- *enhancing the income and employment opportunities* that will help to improve the access of the poor to basic goods and services; forestry could be a major source of employment in many areas, generating income, especially during critical periods when employment opportunities in other sectors are not available; a key issue that will require detailed consideration in this context is the choice of technology, inasmuch as technological choice is usually guided by narrow economic considerations and has tended to be labour-substituting;
- *a reduction in vulnerability to economic and environmental changes;* the poor are particularly vulnerable to decline in the price of export crops, crop and livestock losses resulting from droughts and floods, sickness and death of working members of the family, displacement caused by civil war and

conflict, and other variables; it will become imperative for every country vulnerable to natural disasters to develop an emergency programme to address such events, taking into account the potentials and constraints of forestry.

The focus on the production of basic-needs goods and the generation of basic-needs income in no way rules out the production of non-basic items. If social and economic development helps to reduce poverty significantly, production priorities could shift, and the basket of goods considered basic could be enlarged to include a range of additional forest products. Sawnwood, panels, newsprint, and printing and writing paper, for example, could become important items, and could be produced locally or imported depending on comparative advantages.

Forestry in enhancing environmental values

The other major focus of forestry will be protection of the environment, which is critical to the long-term well-being of Africa. Environmental protection and poverty alleviation are inseparable. Unsustainable use of natural resources undermines food security and increases vulnerability. Efforts to enhance environmental values would specifically involve:

- the protection and improvement of watersheds to stabilize waterflows and to reduce soil erosion and siltation; the importance of water as a critical resource must be recognized;
- the arresting of land degradation and desertification, especially in arid and semi-arid areas;
- the conservation of biodiversity, especially in countries with high endemism; conservation efforts should not be limited to designated protected areas.

This shift in emphasis does not exclude commercial forestry, as long as it does not impair environmental values, helps to improve the livelihood of people on a sustainable basis, and does not increase vulnerability to economic and environmental changes.

Subregional priorities

What does this overall shift in forest-sector priorities imply for the various subregions? A broad indication of some likely subregional priorities is given in Table 13.

MOVING TOWARDS THE GREAT TRANSITION

Moving towards the Great Transition and addressing the priorities described earlier involves strengthening the positive tendencies of the three core scenarios – the public sector dominance, market forces and informal sector scenarios. As discussed earlier, each of these core scenarios has a number of positive aspects, and the Great Transition aims to strengthen these aspects, while curtailing some of the negative tendencies. Much of the efforts to accomplish the Great Transition are in the realm of policy and institutional changes. The key elements of these are discussed below.

Revitalizing the public sector

Public sector management of forest resources has several undeniable weaknesses, and most policies and legislation in the past have attempted to exclude other actors from managing the resources or even having a say in how they are managed. A response to the criticism of public sector inefficiency has been to reduce its functions, transferring some of them to the private sector. This has been one of the main areas of reform implemented by many countries under structural adjustment programmes, although the experience to date suggests that often such transfer of public sector functions has not necessarily improved efficiency or led to the development of a viable private sector. Especially in the case of most countries in Africa, there is a need for a strong public sector to provide the necessary conditions for the private sector and other actors to function effectively. Revitalization of the public sector would involve the following elements.

Redefinition of the structure and function of public forestry agencies

The production of wood has historically been one of the primary responsibilities of public forestry administrations in many countries, and this has to some extent diluted or vitiated the responsibility for providing public goods and services, and, more important, for creating the necessary conditions for other actors to function efficiently and effectively. While gradually divesting themselves of responsibility for wood production and such other goods and services as could be provided by the private sector, including farmers, communities and industries, forestry agencies need to concentrate on:

- providing an effective policy and legal framework that will empower other actors to fulfil the task of supplying goods and services;
- functioning as an impartial arbitrator to resolve conflicts among the various actors;
- monitoring the overall development of the sector including assessment of its performance in the context of development goals;

TABLE 13
Likely subregional priorities

Subregion	Poverty alleviation	Environmental protection
North Africa	• Support for rural industries based on wood and non-wood forest products, focusing on employment generation • Support for the livestock economy through the provision of fodder, especially during periods of drought and improved range management • Increased participation of local communities in the development of ecotourism	• Watershed protection • Protection of agricultural land against sand intrusion and degradation
East Africa	• Provision of woodfuel to rural and urban poor • Strengthening of non-wood forest products-based industries, including medicinal plants, to generate employment and income • Improvement in the technical and entrepreneurial capacity of traditional wood-based industries • Enhancement of the flow of income to local communities from wildlife management	• Protection of watersheds • Integration of tree cropping in all land uses • Improvement in the institutional framework for effective management of protected areas and biodiversity protection
Southern Africa	• Support to the forest-based informal sector by improving the policy and institutional framework for enhancing its contribution to employment • Increased emphasis on social considerations in implementing commercial forestry • Refinement and wider application of the community participation approach in the management of natural resources	• Watershed management • Improvement in land use practices to arrest degradation • Effective use of environmental impact assessment in implementing land use changes, including the establishment of forest plantations
Central Africa	• Improvement in the policy, legal and institutional framework so that local entrepreneurs and communities can play a lead role in forest management and wood processing • Safeguarding of the livelihood of forest-dwelling communities • Improved collection of revenue from forest concessions • Investment of part of the income from forests in social development, especially rural infrastructure such as schools, health centres and roads	• Wider application of criteria and indicators for sustainable forest management, including reduced-impact logging techniques • Scaling down of logging rates, taking into account the institutional capacity to regulate harvesting • Improved management of protected areas
West Africa	• Improved local participation in forest management and wood processing • Technical and institutional support for small-scale forest enterprises	• Watershed protection and prevention of land degradation, including the arresting of desertification • Improvement in the management of natural forests through application of criteria and indicators for sustainable forest management • Increased coverage of protected area networks

- strategic planning, taking into account developments inside and outside the country.

This shift in functions will require substantial structural changes as well as the acquisition of new skills.

Another important function that a revitalized public sector has to shoulder is the provision of some of the environmental services that are purely in the "public domain" and cannot be provided by other actors. It may also have to develop frameworks for sharing the costs and benefits of providing environmental benefits, especially when the market mechanism is unlikely to result in optimal resource allocation. This will be particularly the case with watershed management, which will require the formulation and enforcement of principles and rules of compensation to be paid by the beneficiaries to those who have to forgo certain options.

Strengthening of scientific and technological capacity in the forest sector

Sustainable forest management requires considerable investment in science and technology, especially to improve local technical knowledge. In the African context, private sector research is largely confined to plantation forestry, whereas critical issues relating to the sustainable management of indigenous forests and non-wood forest products and the enhancement of environmental values are inadequately addressed. It is imperative that the public sector play a lead role in strengthening forest science and technology. Existing regional and subregional organizations could encourage collaboration. A related area of substantial public sector involvement is in improving access to information. As the number of stakeholders increases, access to relevant information will be increasingly vital, but for the vast majority of stakeholders it will become increasingly difficult to obtain such information. Improving access to information, especially for communities and civil society organizations, will be a critical function of the public sector.

Development of transparent and accountable institutions

Civil society has a crucial role to play in accomplishing the Great Transition, and an important function of public sector agencies will be that of facilitating the

BOX 34

NEED FOR A NEW TYPE OF FORESTRY

In effect the scenario arising from the combination of forces is telling us that much of what we do, advocate, study and teach in forestry is hopelessly wrong. However, the picture is not all doom and gloom, as it might appear to be. Quite the contrary; it actually is a heaven-sent opportunity. For some time now the world has been signalling that forests are more valuable as forests than they are as wood factories. Forestry's response to this has been, at the best, rather half-hearted, but there is still a chance to redress this. Above all, however, knowing that we are going to be thrown out of what we have taken to be our core business gives us the opportunity to design a really new forestry. And that will be a forestry in which industrial wood is a by-product of ecosystem conservation while the ecosystems themselves are adjusting to the physical environments.

(Leslie, 2001)

BOX 35

FIGHTING WILDLIFE CRIME: THE LUSAKA AGREEMENT TASK FORCE

The Lusaka Agreement Task Force was established in June 1999 to facilitate cooperation among countries to control illegal trade, especially through the cross-border investigation of poaching and illegal trade by criminal syndicates. The task force is the outcome of an intergovernmental agreement that came into force in December 1996. As of March 2000, the countries involved in the task force are the Congo, Kenya, Lesotho, Uganda, Tanzania and Zambia.

emergence of an active civil society. This will require institutionalization of civil society's involvement in policy formulation and implementation. It is most important here to recognize the role of civil society organizations in providing checks and balances to the actions of the public and private sectors. Civil society organizations must be assigned a clear role in defining the mandate of public forestry agencies and in monitoring and evaluating their performance.

Increased coordination of national and regional efforts

Considering the limited resources available, the strengthening of intercountry collaboration, especially in education, training, research and law enforcement, particularly to deal with cross-border illegal activities, is critical (see Box 35).

Strengthening of market forces

There are certain areas of the provision of goods and services where market forces are the most efficient. However, the efficient functioning of market forces requires a number of necessary conditions. In the absence of a strong regulatory framework, market forces are subject to the same deficiencies as the public sector. In an efficient market environment, the private sector undoubtedly has a major role to play in providing goods and services. Efforts should therefore be focused on creating the conditions for the efficient operation of market forces, aiming particularly at:

- providing a strong institutional and legal framework for the efficient operation of market forces and ensuring transparency and effective competition; in privatizing public assets such as forest plantations, valuation methods need to be improved and the process made transparent to ensure that privatization does not result in asset-stripping, to the detriment of the long-term public interest;
- enforcing sustainable forest management through wider adoption of the criteria and indicators of sustainable forest management; the principles of sustainable forest management are already well known, and while they still need further adaptation for local use, considerable improvements can also be made merely by avoiding actions that are known to be clearly unsustainable;
- ensuring that the needs of local communities are fully recognized and institutional mechanisms developed to resolve possible conflicts, while promoting the involvement of the private sector in managing game reserves and national parks; this will be particularly important in areas where wildlife and livestock compete for water and fodder.

Support to the informal sector

The informal sector will continue to be a dominant player in African forestry during the next two decades. Historically, policies and legislation have focused narrowly on the commercialized segment of forestry, ignoring the large number of those operating in the informal sector, thereby disempowering them from making any long-term investment in resource management. It is hard to provide a broadly relevant set of measures to improve the role of the informal sector, especially considering the large number of activities involved. The general approach to improving the situation would primarily involve recognizing the role of the informal sector and providing more conducive conditions for its efficient operation. The steps to be taken could include the following:

- recognition of the importance of the less-organized informal sector in the provision of goods and services, improving its performance by removing legal and institutional bottlenecks and enhancing its capacity for sustainable resource management; the main thrust of strengthening the informal sector will be through promoting local-level institutions and enabling them to coordinate and support the large number of informal sector activities; there is considerable scope for improving technical capacity and skills through training, providing credit through revolving funds, registering enterprises through local community organizations and developing codes of conduct to prevent resource depletion;
- improvement in the legal framework for the operation of the informal sector to avoid its criminalization; some of the major problems of African forestry stem from the widespread criminalization of timber extraction, involving logging companies that take advantage of the weak institutional and legal framework in many countries; many activities take place outside the legal framework, undermining efficiency and reducing the benefits that accrue to society; there is an urgent need to improve the institutional framework, and this will particularly require support from international organizations, including non-governmental organizations, which can assist in tracking the illegal trade in forest products and creating the necessary awareness to discourage illegal activities;
- increased access to information; most of the informal sector operates with imperfect information, especially when products are traded on distant markets involving a network of intermediaries; there is considerable scope for using improved technology to provide information on markets and prices to minimize exploitation by intermediaries and thereby increase the interest of producers in conserving and managing resources;
- development of an effective framework for protecting the intellectual property rights of traditional communities, especially with regard to traditional medicines, and providing necessary incentives for local innovation.

CONCLUSION

The Great Transition envisions fundamental changes in the way social and economic relations are defined. It involves a deepening of democratic processes, concern for human rights, including the right to a clean environment, and the harmonization of economic, social and environmental objectives. The concern for such a transformation is evident in some initiatives currently under way as part of the African renaissance, the most recent of which is NEPAD. Unlike other scenarios, the Great Transition focuses on widespread empowerment of all actors, so that their combined efforts collectively contribute to meeting social, economic and environmental needs.

The Great Transition involves widespread adoption of participatory approaches to local resource management through the establishment and strengthening of democratic institutions. The local capacity to manage resources will be enhanced, ensuring that water, soil and biodiversity are used without undermining their ability to provide goods and services sustainably.

Under the Great Transition, priority will be given to meeting people's basic needs, with emphasis on the needs of the poorest. The nature of the products and services required will undergo changes as society develops. Production, processing and trade will be geared to meet not just the narrow concern with commercial profitability, but larger social, economic and environmental objectives.

The next two decades will see significant changes in forestry as Africa undergoes political, institutional and economic transition. The current economic situation, with all its attendant problems, is a legacy of the past unfavourable political and social environment. As democratic systems become widely established, an upturn in key economic and social variables can be expected after 2010. Until then, forestry and other economic sectors will have to focus on combating poverty by providing essential goods and services and protecting the environment. If positive political and social changes continue as expected, the economic situation should improve significantly after 2010. This would mean that the priorities outlined here would need to be re-examined. While protecting the environment will continue to be a key concern, a shift toward the production of goods and services appropriate to higher income levels may be necessary then.

Chapter 7

Summary and follow-up

The FOSA regional overview report provides a general indication of developments in the African forest sector, specifically focusing on emerging changes as influenced by various factors affecting forests and forestry. Except for a few forest-rich countries, forestry's economic contribution, as measured by conventional indicators such as GDP, is low. This has resulted in the neglect of the sector and overexploitation of timber and other products. Even in countries where the forest sector generates substantial income, the proportion that is reinvested to ensure long-term sustainability is negligible. Developments in the sector during the next two decades will be determined by a number of factors external to the sector. It is therefore imperative to understand how various factors – some of them hard to identify and assess – will influence the sector, and what ought to happen if forestry is to contribute to sustainable development. Identifying what is likely to happen is largely a matter of systematic assessment of the combined direct and indirect impact of the factors that affect forestry, whereas outlining what needs to be done involves value judgments on how the future should be, reflecting the collective vision of people.

SOME KEY FINDINGS

Forests play a major role in the economies and livelihoods of African people. However, efforts to realize the full potential have been far from satisfactory. This stems in part from a number of factors outside the sector and the inability of forest management to address the issues in the larger context. FOSA attempts to provide the larger picture and to place African forestry in the global context, highlighting its potentials and constraints.

Factors affecting the forest sector and their impact

Population growth and its impact on resources will be the most critical factor defining the future of African forestry. With an additional population of 388 million by 2020, the pressure on forests will intensify. Increased demand for agricultural land and forest products will exert pressure on forests and woodlands. Economic growth is likely to remain sluggish; and, except in a few countries with mineral and fossil fuel resources, there will be very little structural shift in economies. This implies continued dependence on land for a majority of the population. Persistent poverty is another major problem in Africa and will be further accentuated by problems such as drought and disease, especially HIV/AIDS, all of which will contribute to food insecurity. Improvement in agricultural productivity will be slow, except in the case of some large commercial farms. This will result in continued forest clearing for agricultural expansion. The pressure on forests will be exacerbated further by illegal logging and a weak institutional capacity to provide an effective regulatory framework, persistent civil conflicts and the weakening of government institutions.

The overall impact of these factors on forests will include the following more specific effects:

- forest cover will continue to be lost, at the same rate as between 1990 and 2000;
- most wood for domestic consumption, and to some extent exports, will come from forests and woodlands that are not sustainably managed. In spite of current efforts, the area under sustainable forest management is unlikely to increase substantially;
- wood will continue to be used primarily as a source of energy. The scope for significant substitution remains limited, except in a few countries with a domestic supply of fossil fuel. Economic and technical constraints will restrict the expansion of wood processing industries;
- although non-wood forest products will remain important for subsistence and trade, unsustainable extraction and habitat degradation will cause their continued depletion. Cultivation will be limited to a few items that are traded. Most processing and value addition will take place outside Africa, largely because of the inadequate development of processing technology;
- wildlife will continue to be a unique resource in Africa, with great potential for boosting tourism. Inadequate infrastructure is a major limiting factor to taking full advantage of tourism potential. More important, this sector is extremely vulnerable to

overall changes in the global economic environment. Persistent land use conflicts will also have significant negative effects. Enhancing the contribution of wildlife to sustainable development depends largely on how local communities are effectively involved in its management, including the equitable sharing of its benefits;

- enhancing the environmental services of forests and trees, especially by protecting watersheds, combating desertification, arresting land degradation and conserving biodiversity, will remain a key concern. Africa's forests play a major role in global climate stability. However, there are major limitations on attracting funds to support afforestation or reforestation under the Clean Development Mechanism;
- forests and woodlands will continue to be a major source of products and services for the growing number of poor in Africa, who will depend on them particularly during droughts and famines.

The precise nature of developments will differ among subregions and countries, so that approaches to increasing forestry's contribution to sustainable development will vary. Responses so far have on the whole been incremental and fragmented, failing to adjust to effects caused by other sectors. The pattern of forestry development has in particular excluded a large number of key actors, and a substantial proportion of people have been disempowered. In the context of the current factors affecting forestry, the capacity of African forests to provide goods and services and contribute to sustainable development could decline significantly.

EMERGING PARADIGM SHIFT

However, African countries and people have the inherent potential to bring about changes. A number of initiatives are in progress at different levels, and there is considerable scope for integrating them into a broader framework, providing a vision and goals for long-term development. There is widespread interest in improving governance, upholding human rights, strengthening democratic processes at all levels, enhancing transparency, investing in human resources and empowering all segments of society. Some of the ongoing initiatives, such as NEPAD, indicate the possibility of a major shift from the historical pattern of social, political, economic and institutional development. A more economically and socially integrated Africa, devoid of conflicts and realizing the capabilities of its people, would bring a major change in how forest resources are managed. This would entail a shift in priorities and the addressing of obstacles to accomplishing these priorities.

Shifts in priorities

Changing the approach to economic and social development in Africa implies corresponding shifts in the forest sector. To date, national forestry agencies and private sector have mostly concentrated on logging natural forests or establishing plantations, with the economic dimension of forestry receiving most of the attention. Social and environmental objectives have been incidental to narrowly defined economic objectives. At least in the foreseeable future, priorities will have to shift in favour of:

- addressing the problem of poverty and ensuring that forests and forestry play direct and indirect roles in improving the livelihood of the poor;
- arresting environmental degradation, especially by protecting and improving watersheds, combating desertification, preventing land degradation and conserving biological diversity.

These two objectives are inseparable, in that addressing poverty is critical for environmental protection, while protecting the environment is critical for addressing poverty through the sustainable production of goods and services. The relative importance of poverty alleviation and environmental protection will vary depending on the specific situation in each country and subregion. Strategies and programmes must be assessed in the perspective of achieving these objectives.

Strategies

Considering the varied conditions in Africa, a range of scenarios could evolve, each resulting in different outcomes. The normative component of the outlook – what ought to be done – thus focuses on minimizing problems arising from the dominance of the negative tendencies in the core scenarios. In this regard, the regional review focuses on:

- revitalizing the public sector by redefining its responsibilities and enabling it to play a lead role in creating the necessary conditions for other players to function effectively; this will require development of the capacity for policy analysis, monitoring of overall development of the forest sector, and provision of a level playing field for other players to be effective; the public sector may

continue to hold key responsibilities for protecting the environment and providing other public goods such as research;
- supporting market forces by creating the conditions, including the necessary legal and institutional framework, for transparent and efficient functioning of the private sector; specific attention must be given to fostering the widest possible range of entrepreneurial capacity, especially of farmers and small-scale entrepreneurs;
- improving the efficiency of unorganized informal sector activities such as pitsawing, charcoal production, the collection and trading of non-wood forest products and other small-scale enterprises by providing the necessary institutional and legal framework for enhancing their contribution to the economy.

FOSA FOLLOW-UP

Typical of all long-term outlook studies, FOSA has a number of limitations. These are particularly related to the following factors:
- the extreme diversity of social, economic and environmental conditions in African countries and subregions, coupled with uncertainties, making it hard to predict how the situation will unfold over time;
- increased uncertainly resulting from the sheer length of the time horizon of two decades; even with sophisticated econometric models involving variables whose relationship is well established, it becomes hard to provide a definitive indication of changes; when there are several qualitative variables that defy measurement, it becomes all the more difficult to provide a reliable indication of emerging changes.

Considering the above limitations, this regional overview report has attempted to outline the general direction of changes. It should be seen more as a tool and process to help raise questions on the future and to articulate efforts to look ahead and identify appropriate paths for development.

FOSA was initiated as a multistage exercise with country focal points playing a key role through the preparation of country outlook papers. These formed an important starting point in preparing subregional and regional reports. Efforts should now be concentrated at the country level, possibly focusing on the following elements:
- *using FOSA in strengthening national forest programmes.* The broader outlook presented in FOSA gives a clearer picture of the larger context in which national forest programmes are formulated and implemented. It provides global, regional and subregional perspectives and helps countries to see opportunities and constraints based on the experience of others. This becomes particularly important in the context of globalization and the increasing interdependence of countries;
- *periodic review and updating.* As events rapidly unfold, the paths being pursued in development need to be reviewed and mid-course corrections made. Africa will continue to experience rapid changes, and some of these are quite unpredictable at present. It is therefore important that the outlook identified here be periodically reviewed in the light of changes that were not initially envisaged. The development of an outlook watch will be an important follow-up in order to support the policy and planning process at the country level;
- *support for networking on outlook studies.* Considering the fact that developments at the global, regional and subregional levels could have a significant effect on forestry at the country level, it is important to step up the sharing of information on such developments and to share ideas and perceptions of changes. The FOSA process has helped to build a network of country focal points and regional and subregional experts. Efforts should be focused on sustaining and strengthening the networking of those involved and interested in outlook studies, and on developing a critical mass of experts;
- *capacity building.* One of the major constraints in undertaking long-term forestry outlook studies is the very limited national-level capacity. The ability to incorporate intersectoral issues and provide a long-term perspective is thus limited in most countries in the region. Another leading area of FOSA follow-up will be to increase the capacity for long-term strategic planning at the national and subregional levels.

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